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TITANIC MARITIME MEMORIAL ACT

mf 118 ORIGINAL

HEARING

BEFORE THE

COMMITTEE ON MERCHANT MARINE AND FISHERIES HOUSE OF REPRESENTATIVES

NINETY-NINTH CONGRESS

FIRST SESSION

COMPLETED 116

ON

H.R. 3272

A BILL TO DESIGNATE THE SHIPWRECK OF THE TITANIC AS A MARITIME MEMORIAL AND TO PROVIDE FOR REASONABLE RESEARCH, EXPLORATION, AND, IF APPROPRIATE, SALVAGE ACTIVITIES

OCTOBER 29, 1985

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THE TITANIC MARITIME MEMORIAL ACT OF 1985

TUESDAY, OCTOBER 29, 1985

HOUSE OF REPRESENTATIVES,
COMMITTEE ON MERCHANT MARINE AND FISHERIES,
Washington, DC.

The committee met, pursuant to call, at 1:40 p.m., in room 1334, Longworth House Office Building, Hon. Walter B. Jones (chairman of the committee) presiding.

Present: Representatives Jones, Anderson, Studds, Hughes, Carper, Bosco, Tallon, Thomas, Ortiz, Manton, Shumway, Fields, Schneider, McKernan, Franklin, Chappie, Saxton, and Bentley.

OPENING STATEMENT OF HON. WALTER B. JONES, A U.S. REPRESENTATIVE FROM NORTH CAROLINA, AND CHAIRMAN, MERCHANT MARINE AND FISHERIES COMMITTEE

The CHAIRMAN. The meeting will come to order, please.

Without objection from any part of the members of the committee, the TV cameras will be on during the session.

Is there any objection?

If not, so ordered.

This morning the Oceanography Subcommittee held a hearing on the issue of shipwrecks. This afternoon we will listen to testimony concerning a particular shipwreck of such unique significance as to merit its own hearing.

Many consider it to have been the greatest of all maritime disasters. Like most people, I was intrigued by the recent discovery of the *Titanic*. Shortly thereafter, I introduced H.R. 3272. This bill memorializes the shipwreck of the *Titanic* as a gravesite to the more than 1,500 passengers who perished with her.

Immediately after this tragedy occurred in April 1912, the Senate held hearings to learn of its cause. Seventy-three years later, this committee will reopen discussion of the *Titanic* disaster.

However, the purpose of our meeting today is to establish a record by which Congress can determine how the United States should now proceed, given the fact that the *Titanic* has finally been located.

Some folks would like to see the shipwreck salvaged immediately. Others feel strongly that she should remain undisturbed where she rests on the ocean floor.

H.R. 3272 will ensure that we give thoughtful consideration to all of these views before any activities proceed.

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The first three panels are composed of witnesses who represent both viewpoints and include the leader of the American discovery team, a representative of the Titanic Historical Society, one of the survivors of the *Titanic*, and a gentleman who probably wishes to salvage the shipwreck.

The fourth and fifth panels will specifically address the language in H.R. 3272. The administration will give its views on the bill. NOAA will then talk about its experience in developing guidelines for managing shipwrecksites.

NOAA, of course, has demonstrated its expertise in managing another famous shipwreck, the USS *Monitor*, a Civil War vessel lying off the coast of my own district in the State of North Carolina.

Finally, the international mechanisms which might be appropriate for negotiations with other interested countries will be described.

We look forward to hearing the statements which each witness has prepared for this hearing.

Mr. Fields, do you care to be recognized at this time?

Mr. FIELDS. Yes, sir. Mr. Chairman, I would ask by unanimous consent the statement of the ranking minority member, Mr. Lent from New York, be made part of the record.

The CHAIRMAN. Without objection, so ordered.

[The statement of Mr. Lent follows:]

STATEMENT OF HON. NORMAN F. LENT, A U.S. REPRESENTATIVE FROM NEW YORK

Mr. Chairman, I am very pleased that we are having this hearing this afternoon to explore the ramifications of the proposed Titanic Maritime Memorial Act. First, I want to commend Bob Ballard, his colleagues on board the research vessel R/V *Knorr*, and his French colleagues for their spectacular demonstration of how successful modern technology can be in promoting underwater exploration. I assume that the Navy does not plan routinely to use the video- and sonar-equipped *Argo* to search for sunken luxury liners, but this mission certainly has captured the public's interest.

The significance of the *Titanic* lies not in the value of the jewelry that went down with her, nor from what we might learn about ship construction from studying her wreckage.

Instead, the significant point is that the loss of the supposedly unsinkable *Titanic* marked something of a turning point for technological Western society. As Nicholas Wade has noted in the New Times, the sinking of the *Titanic* was a "jolt to the self-assurance of the times. The *Titanic* was a marvel of technology, widely regarded as unsinkable. Yet safety received a fraction of the attention devoted to its luxury."

The sinking of the *Titanic* focused international attention on the need for numerous improvements in maritime safety standards. Her loss was a costly reminder that man and his technology must always respect the forces of nature.

By establishing the *Titanic* as an international maritime memorial, we would pay tribute to the souls of the lost passengers and crew, and to the belief that their loss was not in vain, because of the resultant demand for improvement of international maritime safety standards. We also would establish a permanent reminder that, in our exploration and exploitation of marine resources, we should maintain a sense of perspective and humility, the knowledge that man's grandest creations and technological sucesses must respect the powers—and potentials for hazard—that we encounter in Mother Nature.

STATEMENT OF HON. JACK FIELDS, A U.S. REPRESENTATIVE FROM THE STATE OF TEXAS

Mr. FIELDS. I thank you for scheduling this hearing today to address the many intriguing issues which now face us as a result of the discovery of the wreck of the RMS *Titanic*. I think you are ab-

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solutely correct in believing that this committee and this Congress have a right and a responsibility to help determine whether or not the wreckage of the *Titanic* should be preserved as a memorial to those who died during her maiden voyage.

Each of us has seen movies, we have read books and we have watched television documentaries concerning the sinking of the *Titanic* more than 73 years ago in the North Atlantic. Unquestionably, that maritime disaster in which more than 1,500 persons lost their lives has attracted greater public interest and greater curiosity than any other shipwreck in modern history.

You could ask the question why the unequalled fascination with the *Titanic*. First, the fact that a luxury liner billed as unsinkable could sink makes the *Titanic* of interest to the public.

Second, that this unsinkable vessel could sink so quickly 2½ hours after striking an iceberg, shook the public's faith in technology.

Third, that the manufacturers and operators of such an advanced-design ship could have overlooked the one simple device, lifeboats, which could have prevented such a massive loss of life adds to the irony surrounding the *Titanic* sinking.

The final irony concerns another ship, the *Californian*. Was the *Californian* close enough to have rescued passengers from the doomed luxury liner and, if so, why did it not come to the aid of the *Titanic*'s passengers?

Mr. Chairman, the warmth and orderliness of this room stands in sharp contrast to the terror one of our witnesses, Louise Pope, must have felt as a 4-year-old *Titanic* passenger on the cold, confusing night of April 14, 1912. Her experience is not unique.

The 704 other *Titanic* survivors endured that same confusion and terror as did those men and women who perished aboard the unsinkable *Titanic*.

It is in the memory and for the benefit of both survivors and victims that you have offered H.R. 3272.

Our own Government decided decades ago to seal off the U.S.S. *Arizona* in Pearl Harbor. Since then the *Arizona* has served as a maritime tomb to the more than 1,000 members of her crew killed during the Japanese attack on Pearl Harbor in 1941. That tomb has served as an effective, and popular, memorial to their memory. And, it has given comfort and solace to their survivors and descendents. Those of us on this committee should consider giving those who sailed aboard the *Titanic*, survivors and victims alike, a similar memorial, one that would provide their descendants the peace of mind they so much deserve.

Mr. Chairman, your legislation H.R. 3272, the Titanic Memorial Act of 1985, should be given favorable consideration by both this committee and by the Congress.

Again, I appreciate your scheduling this hearing and look forward to the testimony from the witnesses with us today.

The CHAIRMAN. The Chair recognizes Mr. Anderson from California for any remarks you might see fit to make.

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STATEMENT OF HON. GLENN ANDERSON, A U.S. REPRESENTATIVE FROM THE STATE OF CALIFORNIA

Mr. ANDERSON. Thank you, Mr. Chairman.

I, too, would like to commend you for holding this hearing to explore the problems involved in the disposition of the *Titanic*. The *Titanic* sunk off the Canadian coast over 70 years ago and the tale of this unsinkable vessel is familiar to all of us. Until recently, the issues involved in the *Titanic* were basically questions of who did or could have done something to avert the disaster. This picture has changed dramatically with the recent discovery by a joint American and French team of RMS *Titanic*.

The wreck presumably lies in international waters and, therefore, may be governed by traditional salvage laws. In the absence of some concerted international action, salvage activities would commence without consideration of the historical, cultural or scientific significance of the wreck. Not to overlook the fact that over 1,500 people died aboard the *Titanic*.

H.R. 3272, the Titanic Maritime Memorial Act is one vehicle for coordinating the efforts to develop a policy for exploring, salvaging or not tampering with the wreck. I look forward to the discussion this afternoon which will help us to decide what would be the appropriate course of action to take in dealing with the wreck of the RMS *Titanic*.

I thank the gentleman.

The CHAIRMAN. Do any other members of the committee wish to be heard at this time?

Mrs. Bentley, the Chair is happy to recognize you.

STATEMENT OF HON. HELEN DELICH BENTLEY, A U.S. REPRESENTATIVE FROM THE STATE OF MARYLAND

Mrs. BENTLEY. Thank you, Mr. Chairman.

I join my colleagues in commending you, Mr. Chairman, for scheduling this hearing. The discovery of the RMS *Titanic* on September 1, 1985 by a joint United States/French research team was a truly significant display of advanced American technology. The U.S. Navy research vessel, *Knorr*, as well as the American unmanned submersibles, the *Argo* and the *Angus*, were quite instrumental in the discovery.

I am very proud that Americans such as Dr. Robert Ballard were part of the research team which located the *Titanic*. Our interest in this project should not diminish.

Rather, the U.S. Government should cooperate with other interested nations to govern future activities at the *Titanic* site. This is one of the goals which Chairman Jones' legislation, H.R. 3272, proposes to attain and it is for this reason that I support this legislation.

In addition, I support further advances in American technological research. At this time I would like to welcome all the witnesses and congratulate Dr. Ballard for his part in this great discovery.

[A copy of the bill follows:]

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99TH CONGRESS
1ST SESSION

H. R. 3272

To designate the shipwreck of the Titanic as a maritime memorial and to provide for reasonable research, exploration, and, if appropriate, salvage activities.

IN THE HOUSE OF REPRESENTATIVES

SEPTEMBER 11, 1985

Mr. JONES of North Carolina (for himself, Mr. LENT, Mr. BIAGGI, Mr. STUDDS, Mr. LOWRY of Washington, Mr. CARPER, and Mr. HUGHES) introduced the following bill; which was referred to the Committee on Merchant Marine and Fisheries

---

A BILL

To designate the shipwreck of the Titanic as a maritime memorial and to provide for reasonable research, exploration, and, if appropriate, salvage activities.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE.

This Act may be cited as "The Titanic Maritime Memorial Act of 1985".

SEC. 2. FINDINGS AND PURPOSES.

(a) FINDINGS.—The Congress finds that—

(1) the Titanic, the ocean liner which sank on her maiden voyage after striking an iceberg on April 14,

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1912, is a maritime memorial to the men, women, and children who perished aboard her;

(2) the recent discovery of the shipwreck Titanic, lying more than twelve thousand feet beneath the ocean surface, demonstrates the practical applications of ocean science and engineering;

(3) the shipwreck Titanic, well preserved in the cold, oxygen-poor waters of the deep North Atlantic Ocean, is of major national and international historical significance;

(4) the shipwreck Titanic represents a special opportunity for deep ocean scientific research and exploration; and

(5) the shipwreck Titanic is a cultural and historical memorial which merits reasonable international protection.

(b) PURPOSES.—The Congress declares that the purposes of this Act are—

(1) to establish the shipwreck Titanic as an international maritime memorial to those who lost their lives aboard her in 1912;

(2) to require the establishment of national guidelines for conducting research on and exploration and, if appropriate, salvage of the shipwreck Titanic;

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(3) to express the sense of the United States Congress that all nations conduct their activities relating to the shipwreck Titanic in accordance with these guidelines; and

(4) to direct the United States to enter into negotiations with other interested nations, including Great Britain, France, and Canada, to establish an international agreement which will protect the scientific, historical, and cultural significance of the shipwreck Titanic.

SEC. 3. DEFINITIONS.

(a) "Administrator" means the Administrator of the National Oceanic and Atmospheric Administration (NOAA);

(b) "Secretary" means the Secretary of State;

(c) "Shipwreck" means the vessel, Titanic, her cargo, and other contents;

(d) "United States" means the several States, the District of Columbia, the Commonwealth of Puerto Rico, American Samoa, the United States Virgin Islands, Guam, and any other Commonwealth, territory, or possession of the United States.

SEC. 4. COMMENDATION.

The Congress of the United States highly commends the members of the joint international expedition which discovered the shipwreck Titanic, and urges that this cooperative

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effort serve as a model for further international activities related to this memorial.

SEC. 5. NATIONAL GUIDELINES.

(a) The Administrator shall develop guidelines to govern research, exploration, and, if appropriate, salvage of the shipwreck Titanic, which: (1) are consistent with its historical and cultural significance, as well as the purposes and policies of this Act; (2) promote the safety of individuals involved in such operations; and (3) recognize the sanctity of the shipwreck Titanic as a maritime memorial.

(b) In developing these guidelines, the Administrator shall consult with other interested Federal agencies, academic and research institutions, and members of the public.

SEC. 6. INTERNATIONAL AGREEMENT.

(a) The Secretary is directed to enter into negotiations to develop an international agreement which provides for international research, exploration, and, if appropriate, salvage of the shipwreck Titanic consistent with guidelines developed pursuant to section 5 and the purposes and policies of this Act.

(b) The Secretary shall consult with the Administrator when fulfilling section 6(a) above. The Administrator shall provide research and technical assistance to the Secretary.

(c) Upon adoption of an international agreement under section 6, the Secretary shall provide notification of the

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agreement to the Committee on Merchant Marine and Fisheries in the House of Representatives and to the appropriate committee in the Senate, including recommendations for legislation to implement the agreement.

SEC. 7. SENSE OF CONGRESS.

It is the sense of Congress that pending adoption of an international agreement under section 6, no nations should undertake any activities in regard to the shipwreck Titanic which are not in compliance with the guidelines developed under section 5.

SEC. 8. DISCLAIMER OF EXTRATERRITORIAL SOVEREIGNTY.

By enactment of this Act, the United States does not assert sovereignty or jurisdiction over, or the ownership of, any marine areas, the vessel or any of its cargo, unless otherwise subject to its jurisdiction.

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The CHAIRMAN. Does any other member wish to be heard prior to the opening testimony?

If not, the Chair is happy to welcome to this committee the outstanding gentleman who was responsible, as I understand it, for discovering the *Titanic*, Dr. Ballard. He is accompanied by Jon Hollis of the Titanic Historical Society, Inc. The two gentlemen are now recognized by the chairman of the committee.

Dr. Ballard, you may take over.

STATEMENTS OF ROBERT D. BALLARD, DIRECTOR, DEEP SUBMERGENCE LABORATORY, WOODS HOLE OCEANOGRAPHIC INSTITUTION; AND JON HOLLIS, SPOKESPERSON, TITANIC HISTORICAL SOCIETY, INC., INDIAN ORCHARD, MA

Mr. BALLARD. I want to thank the chairman and the other committee members for inviting me here today. I know that we have a room full of experts who know a great deal about the *Titanic* historically, the impact it has had upon our society. What I would like to do in the short time that I have is really provide the committee members with information that dealt with our expedition, what motivated us, how we went about it, and then, most important, the present status of the *Titanic* as it sits on the bottom today.

Ironically, the research that led to the development of the instrumentation that found the *Titanic* both in France and the United States was the product of a long-term investment on both countries' parts to not look for ships, but to conduct basic research in the deep sea. Had we not had this long, long history of support for oceanographic research, we would have not been able to discover the *Titanic*.

Initially, our exploration of the deep sea really has been focusing on mapping it and understanding what we have in the deep sea. Most people's concepts of the ocean is a fairly simplistic one, but in fact the ocean is dominated by tremendous mountain ranges and other geographical features.

When we first began exploring the deep sea we used manned submersibles and over the years we have been using a variety of instrument systems, working with France. This is their vessel, *Sea Anna*, the submarine that we used over 12 years ago in a joint expedition called Project Famous.

Our submarine *Alban* which is a Navy-owned submarine, but is operated by the Woods Hole Oceanographic Institution, has been in service to the scientific and military community for over 20 years.

What we have learned over these last 20 years using manned submersibles is that we are extremely limited by our ability to work in the deep sea. It is important to realize that the ocean's average depth is over 12,000 feet. This means that to go down and explore the bottom of the ocean in a manned submarine requires an elevator ride of over 2 hours each way.

As a result, just to go and do research in the deep sea you have to spend 4 to 5 hours commuting to and from work. As a result, the amount of time that you actually spend in the deep sea is measured in a matter of a few hours each day.

As a result researchers both at Woods Hole, Lamont Scripps and other institutions, have been attempting to develop more advanced

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technologies, technologies that will provide us with an opportunity to greatly increase our fishery in deep sea exploration and the technologies that we developed for the *Titanic* exercise was really not developed to go and find the *Titanic*. They were developed for a variety of other scientific and engineering purposes.

The *Titanic* just provided an excellent opportunity to exercise this new advance in technology. The system that the French have developed actually was developed for the exploration of manganese nodules in the deep sea.

This vehicle is called the SAR. It is a very advanced sonar side-scan vehicle that is built upon other technologies but it has made its own unique contribution. The SAR was the first vehicle that we went out and used this summer on the French research vessel, *Le Suroit*, which is operated by the French agency, Eframire.

France has worked with the United States under the bilateral agreement between the two nations for over 15 years and this was another example of that joint international cooperation. The SAR is a vehicle that is complemented by a magnetometer. In the case of the search for the *Titanic*, the side-scan sonar acts very much like an underwater radar if you can think of it in that way, and as a result on your records you have a lot of different targets and what is very difficult is to just go and look at every target. You can't afford the time, the ship time, to go out and examine every blip on this sonar record.

To help complement that sonar, the French developed a magnetometer, this little object in the foreground which they towed behind the sonar.

As a result, they were able to determine if a blip out several hundred meters away from the towed vehicle was, in fact, a natural object, an outcropping of rock or, in fact, was a metallic object. As a result, we could eliminate the vast majority of our targets.

In fact, with the French expedition we searched over 80 percent of the search area and never encountered a magnetic target that would be comparable to the *Titanic*, so we were able to eliminate very rapidly a tremendous area of the sea floor using this combined technology.

The ship that followed the French leg was the research vessel *Knorr*. It is a Navy ship. Again, like our submarine, *Alban*, that is operated by the Woods Hole Oceanographic Institution, it is comparable to the way in which Scripps and Lamont and other oceanographers, Rhode Island, conduct their research using government ships.

What is very unique about the *Knorr* and its sister ship, the *Melville*, which is operated by Scripps in La Jolla, is this ship is outfitted with a very unique propulsion plant. Were it not for this unique propulsion capability, I am sure we wouldn't have been able to bring you the pretty pictures that I will show you shortly of the *Titanic* itself.

The ship, instead of having propellers, has two units that are called cycloids. These are like giant eggbeaters which are on the fore and after part of the ship. You might wonder how you can have blades go around in a vertical to make a ship go forward but this carriage as it rotates fore and aft can vary the pitch on the

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blades and that varying of pitch means that you can full thrust the ship in any direction.

It is a very unique oceanographic platform that the academic community has access to. So, that makes it possible and when we encountered the *Titanic* and then began to encounter heavy seas, because we had this unique Navy ship, we were able to hold ourselves in the wind and sea and move laterally, never presenting a broad side into the trough or into the wind.

This made it possible even in 40-knot winds to keep the camera system a few feet off the deck of the ship. In addition to this unique ship, we also used what are called acoustic transponders. It was necessary to track our vehicle very precisely and we again developed that. Many years ago under oceanography research funding to explore the deep sea and we use that now as a routine technology in the deep sea.

The Argo vehicle itself is fairly unique. It has been funded by the U.S. Navy, both for academic and scientific application but also to assist the Navy in searching and finding items that are lost. Where the Argo system really comes into play is that it not only has side-scan sonar, it has a very unique imaging capability.

This is the ship, *the Knorr*, on station at the *Titanic* site. The weather here is nice. It was not always nice. You normally take your pretty pictures in Zodiac when the weather is nice. Lowering it into the ocean, we then dropped it on our crane system, the 13,000 feet we had to lower it to reach the bottom. Once on the bottom, the concept of the Argo, and ultimately Jason system, is to give scientists or anyone, commercial people, military people, what we refer to as a telepresence.

This sounds sort of like Star Trekie, and actually, it is very much like Star Trek in when Scotty beams you down, what they do here is they beam you mentally. The concept of telepresence is really not the advent of major efforts in the ocean.

Telepresence is an outgrowth of the Space Program, sending robots to Mars and Venus. It is an outgrowth of military developments of what we call—what the military refers to as remote presence, removing people from combat or in our every day life working with television.

As you know, NFL coverage gets better and better each year and that is due to the tremendous advances that are taking place in television technology and if you go to the cinema today you find that it is cinema one, two, three, four, and what is evolving in our society is a more personalized way of doing things. Telepresent technology is now entering the deep sea. It is largely responsible for our *Titanic* discovery because instead of now going down to the deep sea in a submarine and spending just a matter of a few hours, the Argo/Jason system and similar systems like it will be able to project yourself into the deep sea where you will remain there days on end. Instead of having to recover this vehicle system at the end of the day, it worked 24 hours a day.

Up at the top, that little thing up there is basically a television studio. I will show you that in a minute. It provides you—this is inside the control van. It is sort of done like a mobile home.

The vans are shipped across the country on trucks and then glued together once they are mounted on a ship. They give you this

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telepresence down below. We have the side-scan sonar systems most people use that help you to know what is out to your sides. That is what you see coming out of the machine at this moment. This is what it looks like.

It is sort of a funny looking record to the lay person, but you will see those white objectives. This happens to be as we are going through the *Titanic* wreckage and large objects are standing up casting shadows.

Ironically, in the deep sea with sonar shadows are white instead of black because they show that no energy is returning from behind the object. So, that is what you are seeing here.

This is very useful but, unfortunately, it is very ambiguous. Sometimes you get blobs and you don't know what they are.

That is where the imaging system is so critical. This is a tremendous step forward in living inside a cramped little submarine. I have spent 20 years of my life on my hands and knees in the dark with a flashlight exploring the deep sea. It is very frustrating crawling around in the deep sea on your hands and knees when you realize that it is 71 percent of the planet and it could take the rest of mankind's life to do that.

It is this new telepresence that makes it possible to sit in relative comfort, eventually even sending this back live to shore. You will have an opportunity to—right next to the channel that shows what the Congress is doing will be a channel that shows what is going on in the deep sea. I won't comment who will turn to what channel. It will provide this opportunity for the public.

It is an attempt to get away from this eliteness of sending people places, to have an elite corps that goes to the moon or to the bottom of the ocean and open it up to a much larger community. Particularly, as we age, you will know I am working more and more as I get older and older on the ability to sit on a chair and watch the ocean in comfort. This is where we are headed.

It is a timely discovery for me and I think a lot of us will now be able to experience exploration on a 24-hour basis because of this powerful technology. What you are seeing here is we are sitting looking at the *Titanic* as we are driving over it without vehicle 13,000 feet below. We control it from a number of control points.

This individual is what we refer to as the white knuckle job. This person's responsibility is not to lose this brand-new Navy system on our first trip. This individual's responsibility is to bail out, pull the vehicle if there is some feeling that we may encounter the ship's rigging.

We were very afraid of, on our first trip to sea, coming home with some beautiful pictures and no vehicle. So, this individual is watching the television. You will know he has both hands grasping it, squeezing the pulp out of it and is ready to retreat on any notice.

The beauty of these television camera systems—this is where the technology is really becoming powerful. In the deep sea, we have traditionally used film cameras which have ASA, like a normal film camera, 200 ASA.

This means you have to get very, very close to get a nice picture. Well, for the *Titanic* rigging, close was something we didn't necessarily want to do initially. But because of the advent of these new

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revolutionary cameras called SIT cameras, silicon intensified target camera, it is simply a camera that has a passive light intensification capability. It has an ASA equivalency of over 200,000 ASA, literally able to see in the dark with a very minor amount of light introduced.

Because of that we were able to fly at a very high altitude off the deck. We were able to see the bottom at an altitude of over 100 feet away from it and not only could we then be less concerned about entanglement in the *Titanic*, we could also see a much larger area.

The imaging footprint of this new vehicle system is over 2.5 acres that it can see. So, that ability to see large areas puts you out of crawling around on your hands and knees and gives you that treetop capability of viewing things in a larger perspective and that is what we are able to do with this vehicle system.

In the van you have the captain of the ship on the lower right hand corner and in the captain's of the ship hands are the controls of the ship. So, he is controlling the forward cycloid not on the bridge, but in the van. In addition to that, the person on the far left has a microprocessing capability and can talk to all the instruments down below.

So, it is a very powerful technology that permits us to just stay. Other people have attempted to work on the *Titanic*. Other people have attempted to use other technologies in the deep sea. They were excellent people with excellent equipment.

Where we had an advantage was this awesome staying power visually. We have been involved in a variety of search efforts with the Navy over the years, some classified, some unclassified, that have taught us a great deal on how to find things. We used that to our advantage this summer and it helped us a great deal in finding it because we weren't necessarily looking for the *Titanic*, we were looking for its debris trail and that is what we found.

This is the ship itself. I know other witnesses will give you a much better account of this. I am an amateur in many respects and in awe of the people who can just rattle the *Titanic* lore off, so I am going to let them do that.

But the point is that it was an incredibly beautiful ship. It was brand new. It was outfitted with all the luxuries that money could buy at the time except lifeboats. It had a beautiful entrance. I will show you a picture shooting down from that glass dome. That dome naturally did not survive the impact to the bottom but I will show you a picture looking down into that top part.

This is the first class smoking area. We have found scattered on the floor beautiful stained glass windows. There is a lot of items that are not in the ship proper that I will talk about in a minute that are very vulnerable right now to crude recovery techniques at could destroy it.

Just quickly, the *Titanic* is located on the southern tip of the Grand Banks. Ironically, most people don't realize it is due east of our institution at Woods Hole, 42 degrees latitude roughly, and we have researched it. I have spent over 11 years—12 years as a hobby almost studying the *Titanic*, working with the Titanic Historical Society. Initially, the *Titanic* to me was a target of opportunity to test my technology but I must admit over the 12 years of researching it, with the Titanic Historical Society, the soul of the *Titanic*

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has had a tremendous impact upon me personally and one of the reasons I am here today is to try to protect that ship because of how I know it has affected me.

I think everyone that would go in and look into the *Titanic*'s history can't help but be affected. I don't really have time to review all of our strategies. They are comparable to other people's strategies, as far as the data surrounding the ship, is well published.

The French did an exhaustive study. I don't want to underestimate the French contribution. They made a tremendous contribution to this expedition. They assigned a lot of resources from France and I think it is very important as we proceed that the first country we approach is France. In developing our strategy, we used the historical records about the *Titanic*'s course and bearing and its navigational data, the *Carpathia*, the ship that recovered the survivors, was a critical data base to use.

The *Californian*, I am not here to get into that controversy. Our data does not tell us where the *Californian* was. We simply stayed clear of the *Californian* data base because it was controversial, but we did believe its drift and a number of other factors that led to the creation of our search area.

The search area itself is east of the reported position. No scientists and researchers that have researched the data base believed the *Titanic* was at its current position because it required its speed to be too great. We didn't believe it either and we created a search area that was to the east of the reported position.

The area itself is characterized by a series of submarine canyons and gullies. The Titanic canyon really is more of a gully. It is not a very deep feature. There are much larger canyons to the east and west, but it did present obstacles to us.

The Navy has mapped this area and provided us with very detailed data base and we were able to use that in developing our strategy. The site itself based upon the French data base. For over a month and a half we searched the search area sort of mowing the lawn as we referred to it.

It was a rather monotonous period of time of going back and forth and back and forth searching the primary area. Unfortunately, we encountered extremely strong surface currents in excess of 2 knots at times.

We had gale wind over the top of us at 40 knot winds. It was not pleasant mowing the lawn and as a result it cut into the amount of area that we could cover. In our original search strategy, we were going to make lines up in one direction, turn around and go back, but because the currents were so strong, we had to literally pull the entire search system, the SAR system, run back to the beginning and run another line and pull it and run another line and at times we actually had to pull our equipment and sit out the storms.

But as a result of committing the—the French committed so much time to this effort that we just persevered through the weather and currents and searched the primary area.

In that search we encountered the canyons themselves shown in green which have a lot of small gullies providing a lot of false targets, but fortunately, the magnetometer helped us to eliminate those magnetic anomalies.

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The only anomalies we encountered were more of an edge effect or geologic phenomenon and we were able to discount them because the French had done very sophisticated magnetic modeling to say what it should be and we never encountered a magnetic anomaly that fit their modeling so we were able to rule it out.

That big, monstrous, white arrow is an area of landsliding. The continental slope and rise are characterized by a lot of what we refer to as mass wasting or slumping and landsliding. This area had undergone some historical earthquakes that had broken cables.

We were concerned that the *Titanic* might be buried or some of its debris might be buried by this large landslide and other landslides in the area. That is another reason for having a sonar that could penetrate into the bottom and see objectives, particularly if we picked up a magnetic anomaly, though we couldn't see anything on the sonar, we could then look for it by probing into the bottom.

We never encountered any magnetic anomalies that would suggest a buried object, but we had to prepare for that contingency. In the eastern area was an area of dunal structures. More and more we study the sea, the sillier we feel for a lot of papers we have published over the past because we are learning so much more about the deep sea as a fairly dynamic area.

We found in the side-scan sonar records it looked more like the Sahara Desert with sand dunes than it did the deep sea. We found a lot of these benthic bed forms, as we have referred to them, or sand waves in the eastern area and we were concerned there that the benthic area, the flushing by currents, might remove debris and that caused us to search the canyons for debris.

We went out after the French survey with our vehicle system. We had a number of targets. One naturally was looking for the boilers.

If you look, there is a gentleman half way down that is very small. Maybe you can see his little white collar right in the middle to give you a sense of how large these are.

The *Titanic* witnesses reported this tremendous noise at the sinking and various people had theorized the boilers might have broken loose of their mounts when the ship went vertical and went out the bow.

Naturally they would have brought a lot of other material with them so we were keenly educated on what a boiler looked like so that if we saw one we would know it and ironically as we were mowing the lawn with our system, Argo, looking visually for debris for days and days and days, we were seeing nothing.

We were popping popcorn and listening to music and then, boom, right on our imaging system came this boiler. So I am glad we had done our research, although I don't think it would have taken much research to figure out it was a boiler, but within seconds we immediately knew we found the *Titanic* because we went—the first object we saw was one of these boilers.

The really challenging part for us technologically was to take closeup color pictures. Once we had used the Argo vehicle to find the *Titanic*, and then begin researching it, we were very afraid of this big blob that we had on our sonar target.

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It was the right dimensions of the ship. It was near the boiler. We were convinced it was the ship, but we knew we had to go in very close to take high quality color pictures.

This was probably the most scary part of the expedition.

If you could turn on the house lights for just a second, I will try to explain the problem we were faced with.

Our initial passes on the *Titanic* were done with the high altitude, low light level camera system. We were worried about the big booms, the masts of the ship, and the cables. If you look at that white art work, you can see those cables. We were very afraid of those cables and trapping our vehicle so we had to make our first passes above even the masts.

We saw nothing and so we would slice down, slice down until we had enough nerve to make our first visual pass over the ship itself and we decided to go perpendicular across the ship in the area of the No. 1 stack because we knew that the No. 1 stack had been lost based upon eyewitness accounts and we wanted to approach the forward part of the ship, but we didn't really know what was the forward or the stern so we figured we would go right—we guessed what was the bow and we guessed right and so our first passes came in with the television system and we could see that the ship was sitting upright.

We could see that it was in very good condition relative to—visually good condition. We never actually tried to lift the ship or anything like that in our structural integrity, but it was in very nice condition as the pictures will show.

We made our initial mappings of the ship with this Argo vehicle system, but then the time came to get very close. We are now very close. To get the pictures I am going to show you, we had to be about 15 feet above the surface we were photographing in 13,000 feet of water. The vehicle was blind.

This vehicle Argo has no television system, has no sonar. It just knows its altitude, period. So we had to go in and map these horizons. By mapping, I mean if you look at the profile of the *Titanic*, you will see that one deck is higher than another deck, is higher than another deck.

We had to go in and accurately map each deck level and its exact location where the bridge fell off. For example, our camera, if it went out over here would not take any pictures. The most challenging pictures to take were these crane pictures because these cranes were enveloped up against the base of the bridge.

We had to go down over that. Mr. Chairman, do you want me to continue?

The CHAIRMAN. Doctor, how much time?

Mr. BALLARD. I am now going to blast through the color pictures. I can do it in a matter of minutes.

The CHAIRMAN. You may proceed. It is a great thing in this committee for anybody to do anything in 2 minutes.

Mr. BALLARD. I am going to take you from the bow up to the first-class entrance of the ship so we are going to go on a photograph trip up this part of the ship. So, the first image that you see was taken right on the bow. At the same time I am taking this picture, I have two other cameras going off with different lenses. So

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even though this appears to be a closer shot at the same altitude, it is just a tighter lens and you can see the change on the ship.

So we are right here in this part of the ship at that moment. We are then proceeding up toward the bridge. This is right up in this area. The boom or the mast fell over and collapsed part of the superstructure up on the boat deck. This is along the railing on the starboard side up near the bow. This is the focsle area right here. The deck falls down and this is the entrance to the crew's quarters that you are seeing right there with the ventilation shaft, so this deck here is higher than that deck.

You can see it dropping down. This is the tough shot. This is if you were leaning out of the bridge and looking down. The vehicle is now tucked up against the bridge as it takes this picture of the cranes.

This is a closeup of those cranes that are used to load the personal baggage into the hole, No. 2 hole. This is the No. 1 funnel that is gone. That is right here. It is fallen off and you are looking down into the interior of the ship. This is the entrance to the first class passengers—this is the boat deck right here. They would come and enter the ship and that is where that glass dome was.

If you could peer over this edge you would see this beautiful staircase and this beautiful woodwork that is now exposed through that opening.

The other thing was we could not find the stern initially. It was detached from the ship from about the—between the No. 3 and No. 4 stack aft. It was detached.

We began searching for it. We found it in a number of pieces scattered all over the bottom. This crane, for example, this is looking astern. This little funny metal work is shown right down in there in that little corner. This was one of the after booms.

Also, throughout this area is where you find a lot of these delicate items that by some fate survived this breaking up of the stern and are placed on the bottom. Like I said, stained glass windows from the library. We have identified silver plates.

In this particular case, wine bottles. In some cases, entire boxes of wine bottles sitting on the bottom where the animals had gently eaten away the wood and left all the bottles stacked—their boxes now gone. The decking of the ship because it is perched up above the bottom appears not to have been attached by boring organisms and I suspect a lot of the interior because it is perched up above the bottom, but any wood that was on the bottom in direct contact with the sediments has been eaten, least of all the examples that we had found.

That is what I have visually to present at this point. We are now analyzing all of the data. There is a nice elegant article coming out on it in National Geographic and we have advanced and bound copies for all the committee members we would like to give to you of that issue that will be out in the next couple weeks and I would like to entertain any of your questions.

Thank you.

[The statement of Mr. Ballard follows:]

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STATEMENT OF ROBERT D. BALLARD, DIRECTOR, DEEP SUBMERGENCE LABORATORY, WOODS HOLE OCEANOGRAPHI INSTITUTION

DISCOVERY OF THE R.M.S. "TITANIC"

We are fortunate today to have a number of witnesses present who are scholars on *Titanic* and far better qualified to describe the significance of its sinking, the impact it has had upon society, and the importance of its safe preservation. What I would like to do in the short time I have is to describe, in some detail, *Titanic's* present resting place and its high state of preservation as well as a number of concluding remarks dealing with its future. The expedition to find and document *Titanic* was a joint effort on the part of scientists and engineeers from France and the United States. For over a dozen years, the Woods Hole Oceanographic Institution and IFREMER have conducted major joint expeditions to explore the deep sea. For years, our efforts have focused on the Mid-Ocean Ridge, a tremendous mountain range lying beneath the sea stretching for a distance of 72,000 km. and covering over 28% of earth's total surface area. Prior to our discovery of *Titanic*, this cooperative program has resulted in a number of important scientific finds; the most recent of which has been our discovery of warm water vents in the Pacific, the unusual benthic animal communities surrounding them, and the occurrence of potentially important mineral deposits precipitating out of their hot solutions. In fact, it is our continued interest in exploring the mountains of the sea for scientific and military purposes which led to the development of the advanced robotic technology which was responsible for *Titanic*'s discovery and superb documentation. Two new tools are at the heart of this find. The first is the SAR vehicle developed by France for the detailed investigation of Mn nodules in the Pacific and the second is the ARGO vehicle developed for our continued exploration of undersea mountain ranges. Although *Titanic* was a goal of our expedition this summer, our primary goal was the testing of these new systems before they began their first scientific expeditions. For ARGO, that will begin this December when we investigate a segment of the East Pacific Rise off the coast of western Mexico.

In June, *Le Suroit* sailed from Brest, France. Completing its final tests off France, *Le Suroit* headed west to a cold stretch of the North Atlantic off the Grand Banks of Newfoundland. The crew of *Le Suroit* installed its large network of transponders and lowered its huge search sonar 4,000 meters to the ocean floor and systematically swept back and forth across the bottom. The weather was reasonable for this part of the world, but the surface current was extremely strong; on average, it was over 2 knots. Such a strong current made towing SAR difficult. As a result, valuable search time was lost to the current and later a storm.

Each sonar target was cross-checked with the record produced by the magnetometer towed behind SAR. This combination of sonar and magnetometer was critical. We expected to see numerous sonar targets in the search area which might look like *Titanic*, but only *Titanic* also would have the correct magnetic signature of a large metallic ship.

Originally, our plan was to find *Titanic* with SAR and then view it with ARGO and film it with ANGUS, but the weather and strong surface currents had altered that plan. Although the French had done a valiant effort by searching 80% of the primary area, 20% remained.

When we first arrive[d] in the area with KNORR, we immediately proceeded to the French search area and began listening for the transponder which we had left at the end of the *Le Suroit* cruise. The plan was to install three transponders in such a way that we could use ARGO to visually inspect all of the known targets to date. These targets included two magnetic anomalies along the axis of the canyon, one large anomaly to the east, an area of impact craters, and a variety of less important targets throughout the SAR search area.

It took us about 12 hours to install the new network of transponders. The first target was the area of impact craters. As ARGO approached the bottom an hour and a half later, it began to make runs on the impact craters. Control of the ship was transferred to the ARGO control van where a pilot used the forward cycloid thruster controls to direct the ship's propulsion. Back and forth we went as ARGO's cameras peered into one empty crater after another. After several hours, the search ended and we headed west toward the canyon. The section we were headed for was about 1,000 meters across and 40 to 50 meters deep. The problem was not the depth of the canyon, but the complex series of secondary channels or tributaries that entered the canyon from both sides producing a complex series of sonar shadows.

The magnetic anomalies we had picked up with SAR were on the opposite and western side of the canyon and proved to be rock outcrops. Our final target was the

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southwestern magnetic anomaly which we quickly added to the list of no-shows. In addition, our hope had been that any debris in the immediate area of the canyon might be swept into the canyon axis by the bottom currents that appeared to be active to the east.

With all of the targets in the area searched to date eliminated, the original search plan had to be continued. A search strategy is dependent upon the tools you are using. An acoustical search is very different than a visual search. With a side-scan sonar like SAR, you are searching for the main wreckage which will show up on the records like a large radar blip on the screen, with a high shadow behind it. At the same time, the magnetometer tells you if the object you are looking at is metallic or, like most images, is made of non-metallic rock or sedimentary material.

ARGO has a side-looking sonar but its most important sensors are its unique eyes, super-sensitive cameras which are flown at high altitudes, resulting in a large area to be seen. Heavy objects will sink straight down while the lighter objects which sink more slowly, carried along by any currents in the water column. Our data suggest that at a 1.1 knot southerly current was running the night *Titanic* sank, dispersing the debris in a north-south direction. Based upon these factors, we concluded our best plan was to run east-west lines apart starting in the south and working north in the area not already covered by SAR. It was this strategy which was ultimately responsible for our discovery.

What I would like to do is to present, in a series of slides and video, the visual results of our joint expedition and the images we collected which will appear in the December issue of National Geographic Magazine.

SCIENTIFIC IMPORTANCE OF THE DISCOVERY

The technology used this summer to find *Titanic* is the vangard of telepresence technology now entering the deep sea. Telepresence is the ability to project our thoughts, eyes, and in the most advanced form, our hands into a remote and commonly hostile environment. Exploration in the deep sea is not driving this technology, but it is beginning to benefit from it. The space program with its robots on Mars and Venus, the military with its desire to remove humans from the risks of combat, the commercial work with their evolving television coverage, and the proliferation of multiple cinemas are the primary driving forces behind telepresence technology.

As the introduction of this technology into the deep sea continues, major changes are now taking place. In the scientific community, it is greatly accelerating our rate of discovery. Instead of having to venture to the deep sea floor in tiny manned submarines requiring four to five hours a each day to make a single round-trip for a stay on the bottom measured in a few hours, new technologies like the ARGO and JASON robots permit us to remain in the deep sea environment for weeks on end. Instead of one or to scientists crammed into a cold damp sphere, an entire team of specialists are able to observe, discuss, and directly sample and place instrument systems in the complex terrains beneath the sea.

The U.S. Navy is also a major benefactor of this new revolutionary technology. Instead of large and expensive submarines which we now need to provide our nation with an adequate defense, telepresence technology will permit us to think about building smaller and deeper diving submarines or complementing our present capabilities with remotely operated vehicle systems. Sponsored by the Navy, our development program and its successes are not going unnoticed and are even now having an impact on Navy planners as they attempt to forecast future submarine systems.

The basic scientific community and the U.S. Navy have always been at the forefront of deep sea exploration and I believe that should, and will continue. But this long-term commitment to deep sea research and exploration will ultimately lead to economic returns to the American people. Our discoveries in recent years have, if anything, demonstrated how poorly explored the deep sea truly is. With the creation of the Exclusive Economic Zone [EEZ] and funds to permit its exploration and systematic mapping, I believe economic deposits of heavy metal will soon be found, and it is also my belief that technology like our ARGO/JASON vehicle systems will accelerate the speed of those finds.

I am fully in favor of the bill before you and encourage you to speed its passage as the next weather window at the *Titanic* site is this coming summer. At that time, salvagers can begin to plunder this great historic ship.

I believe the bill should include a statement which recognizes the important and equal contribution made by the French people in finding *Titanic* and that they should be the first nation we approach in establishing an international agreement between other nations of the North Atlantic and eventually the world.

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I also strongly recommend Portugal be added to the initial list of nations, since their islands in the Azores are critically situated near the *Titanic* site with modern ports both France and America used this past summer to mount our *Titanic* efforts.

I further recommend that the National Academy of Science play an active role in the establishment of research guidelines regarding *Titanic* as they reflect the true interests of the scientific community in the U.S. which discovered *Titanic*.

FUTURE HOPES FOR THE "TITANIC"

Since finding *Titanic*, I have received a tremendous number of letters from Americans which address the future hopes of individuals regarding *Titanic*. By an overwhelming majority, Americans, as well as other people from around the world, want to protect *Titanic* from wanton grave robbers. *Titanic* is like a great pyramid which has been found and mankind is about to enter it for the first time since it was sealed. Has he come to plunder or appreciate? The people of the world clearly want the latter.

Since many beautiful artifacts lie outside the ship itself, scattered over the rolling alpine-like countryside around it and are vulnerable to crude and damaging salvage attempts, I am proposing to both our Government and the Government of France that any future revisits to the *Titanic* which would involve the deep diving submersibles of our two countries or any country for that matter, dedicate a portion of their diving time to carefully recording and recovering those delicate items lying outside the hull of the ship itself. The artifacts recovered should be used to create a museum for the countries which join the U.S. and France in setting *Titanic* aside as an international memorial. I further propose that no attempt be made to harm the ship itself or retrieve items from its interior compartments. The interior compartments, we hope, will be documented in detail using remotely controlled vehicles which can be operated from nearby manned submersibles. This footage will provide the public with an opportunity to tour *Titanic*'s interior, like a guided tour through an untouched pyramid.

The CHAIRMAN. The Chair will have to declare a 12-minute recess so members can go to vote. This is the vote on S. 1160, the conference report on Defense Department authorizations.

We will stand in recess for some 12 minutes.

The CHAIRMAN. The committee will come to order, please.

Dr. Ballard, do you have any additional testimony?

Mr. BALLARD. Beg your pardon?

The CHAIRMAN. Do you have any additional testimony?

Mr. BALLARD. Well, I just concluded. What I really wanted to say in the concluding comments is a lot of people say leaving the *Titanic* where it is, in total darkness, what good could that serve, what possible benefit could one obtain from this? I think what is important is that the American genius and world genius in developing technology is very active right now, and the ability to go into the *Titanic* gracefully and film its interior is at hand. The ability to create a beautiful guided tour of this luxury liner is at hand and will be done.

The ability to recover the objects that probably should be done, and brought up and placed in a museum and certainly to those countries that signed or create similar memorial acts, it would be a great insensitivity. So I am not wanting the ship to live in darkness for the rest of its life, not seen by anybody. I think what you have to realize is that the pyramids of the deep sea are now accessible to mankind and we are going to come to plunder or appreciate the *Titantic* is just one piece of history

Think of what is in the bottom of the Mediterranean, for example, and those ships need not be brought to the surface. We need not think in past tense, we should think in future tense. You and I

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and our children will be able to tour that ship and view it in its splendor without having to touch it and damage it.

The CHAIRMAN. Thank you very much for a very interesting series of remarks and pictures.

The Chair recognizes Mr. Hollis.

STATEMENT OF JON HOLLIS

Mr. HOLLIS. Mr. Chairman, members of the committee and honored guests, I should like to take this opportunity to thank you for allowing me to speak on behalf of H.R. 3272 for the Titanic Historical Society.

I should like to present to the committee a brief history of the Titanic Historical Society. The Titanic Historical Society was formed in 1963 by five men of exceptional forsight who suddenly realized that survivors of this great marine disaster were fading into the past and soon there would be no one to tell their tragic stories of that fateful April night and that their memories would be lost to future generations. So the society was formed to perpetuate these memories along with the history of the liner, her builders, and all those who sailed on her tragic maiden voyage, a voyage that was never to be completed.

Today the Titanic Historical Society has almost 2,500 members worldwide, including a number of the actual survivors of this greatest of marine disasters. The roster of the society also includes the names of scholars of higher learning, noted authors, members of the clergy, scientists, motion picture and television people, as well as individuals from all walks of life who are interested in this history.

The Titanic Historical Society was formed in and duly incorporated under the laws of the Commonwealth of Massachusetts as a nonprofit organization. Dues from its membership are used in publishing the society's quarterly journal, "The Titanic Commutator," and acquiring historical material pertaining to the *Titanic*, which are presently housed in the Philadelphia Maritime Museum. A city which, in itself, which was greatly touched by this disaster, having lost a number of prominent citizens onboard the ship.

The society members, in addition to receiving the Titanic Commutator, are also privy to acquiring reprints of many books of that era and publications such as the U.S. Senate hearings summary on the loss of the *Titanic*, along with photographs, plans and models, and other materials pertaining to steamship history. No profit of any kind is realized by the society's officers in the sale of thes items, the moneys received going back into the treasury for the benefit of the members in keeping dues costs at a minimum.

The THS has assisted in the writing of books, the making of various motion pictures and television programs and research for exploration such as the discovery of the *Titanic*'s sister ship H.M.H.S. *Britannic* found by Capt. Jacques Costeau in the Agean Sea in 1977. Captain Costeau had then onboard assistance of the society's late president William H. Tantum IV to aid in important historical data about this liner.

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That gentlemen, is a very brief outline of the Titanic Historical Society, its beginnings and its goals, to keep alive the history of the *Titanic* and the memory of the 1,500 souls who lie with her some 13,000 feet below the North Atlantic.

As for myself, I have been a member of the Titanic Historical Society since 1973 and have been its spokesman on many occasions for local and national television, radio, newspapers, and magazines, and have gone on publicity tours for motion picture promotions to give historical fact and to debunk many rumors of treasure, especially pertaining to the *Titanic*. I have done extensive research for diving operations and for books on steamship history with my own consulting firm known as Mars which is also a nonprofit organization, although it was not planned as such.

The recent discovery of the remains of the R.M.S. *Titanic* by the combined efforts of the French research team, working with the Woods Hole Oceanographic Institute under its elite leader, Dr. Robert Ballard, has the whole society membership, myself included, and most likely the world, in ecstacy that this fantastic new photographic equipment was first used to discover the *Titanic*, said by many, to be the Mount Everest of shipwrecks.

I myself, and I am sure everyone else, awaits the viewing of the spectacular photographs obtained by these two teams working so close together at such a great depth. They are both to be applauded for this joint teamwork.

But let us not forget that this site is the resting place of those 1,500 souls who also had their faith in the science and inventions of 1912, but had their faith—and that of the world—shaken by that cold black iceberg, which struck the mortal blow to this great ship and to society. Many stories of heroism were played out on that night, some of which may still not be known, of the rich and poor alike, who sailed on that ship to pursue their interests in this country or to start a new life in the land of opportunity, but destined never to see its shores. Many of those 1,500 who gave of their lives so that others might live, may still rest within the confines of that White Star liner on the ocean floor.

The Titanic Historical Society asks that this committee under the House of Representatives bill H.R. 3272 to decree this site a memorial site to those 1,500 souls whose final resting place has recently been found and not to create a sacrilege by allowing purveyors of profit to desecrate this gravesite.

I wish to present to the committee, letters received from commercial salvager, Peter Gimbel of *Andrea Doria* fame, stating that he himself, a salvager, feels that any commercial salvage of the *Titanic* or her equipment, would be in very bad taste and she should be protected and explored under controlled conditions. I would also like to submit to the committee, letters from noted marine authors and marine artifact collectors and sellers stating that they also agree the *Titanic* should be left to science and not commercial scavengers of profit.

In the interest of further evidence, I would like to submit to the committee, a copy of the on board cargo manifest of the *Titanic*, that clearly shows that this was a passenger vessel carrying passengers and a limited amount of what is called express cargo. This is not a Spanish treasure ship laden with gold and jewels. It is a

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well documented fact that some passengers retrieved their jewels from the purser and the remaining valuables, along with the ship's papers, were put into postal bags and carried to the boat deck by Purser McElroy and his two assistants, to be loaded into a lifeboat, but were lost overboard and are not even with the wreck.

Mr. Chairman, and distinguished members of the committee, I ask you on behalf of the Titanic Historical Society, its members, remaining survivors, and the relatives of those lost in this great maritime disaster, and myself, to allow these souls to rest in peace and let the R.M.S. *Titanic* lie in quit peaceful dignity. If we allow here to be ravaged and plundered by uncaring profit minded individuals, then her memory, and the memory of those who sailed in her will be lost to future generations.

Do we really want to want to see pieces of *Titanic* for sale in flea markets or in catalog at grossly inflated prices? One such catalog is presently advertising for sale the toilet seats from America's great liner the S.S. *United States* with stories of who has used them referring to royalty and our country's late Presidents. Is this the type of sacrilege that will become of the greatest ship in the world and the memory of the 1,500 souls lying within her? let me bring it all closer to home. If you had a relative who perished in this terrible tragedy, and whose bones were lying in that wreck, could you, in all good conscience allow someone to desecrate that site? If so, gentlemen, then perhaps our next step is to contemplate the raising of the battleship *Arizona* for souvenirs. Please, allow the *Titanic* to rest in peace and grant a safe haven to her passengers and crew who are with her now by passing the bill H.R. 3272.

Gentlemen, if I may make one brief suggestion regarding the bill. Many will state that the wreck is in international waters, so how can it be protected? An amendment to the bill prohibiting the import of any materials or artifacts recovered by the wreck of the *Titanic*, other than by duly licensed and controlled expeditions and any such items recovered, be given to National museums after studies are complete so other local museums may borrow them for the publics interest. No such item recovered will be allowed to be sold commercialy or acquired for personal collection or gains, be added to the bill H.R. 3272. Hopefully, foreign governments will follow your wise leadership here today and enact similar acts of legislation and the *Titanic* and those interred within her, will be safe from desecration.

Thank you.

The CHAIRMAN. Thank you very much.

At this time I am going to open the committee for any questions you might have of Dr. Ballard or Mr. Hollis. The Chair has one or two for Dr. Ballard perhaps.

Is the position of the *Titanic* wreck still confidential or is it assumed that the position is now more or less common knowledge?

Mr. BALLARD. Well, during the last day of our effort out there an aircraft came out to us. I don't know the origin of the aircraft, but it clearly was making navigational fixes on us. Fortunately, we weren't at the site recovering, we were recovering transponders. We were close, so I don't know. I can only assume that that aircraft was able to fix us to within a mile or so.

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The CHAIRMAN. You stated your opposition to actions which would harm the *Titanic*. Are you opposed to any salvage activities?

Mr. BALLARD. No; I am not. As I said moments ago, there are many of the delicate objects that were strewn upon the ocean floor that resulted from the breakup of the stern. I don't see that their particular place or placement on the ocean floor has any historical significance, and I believe that since they are so vulnerable to very primitive dredging operations—you could go out there tomorrow and begin dragging dredges and probably destroy a large percentage of the objects but recover some—and I believe those objects should be protected.

I think it is very important that the committee know that the French Government is returning next year. Whether we go or not is really not determined at this point; it is subject to approvals by the Government. But I do know that the French are returning and are returning with a submarine. So, I know they feel very strong about preservation and I think it would behoove us to move expeditiously to preserve those things that will be recovered.

The CHAIRMAN. Dr. Ballard, do you have any feeling about Great Britain, how they feel about the preservation of the *Titanic*?

Mr. BALLARD. Would you say that again?

The CHAIRMAN. The British Government?

Mr. BALLARD. The British Government feels very strongly. I have been invited to discuss this with British Royalty and the British Government, who are interested in the preservation. As you know, it was flying under their flag. Most of the people aboard, as I understand it—you can correct me—were British citizens as far as the crew is concerned, so they do have a very strong interest in treating it properly.

The CHAIRMAN. Thank you.

Mr. Hollis, an important aspect of this legislation is protecting the cultural significance of the *Titanic* as a gravesite. Have you contacted survivors and families of victims to gauge their reaction to possible salvage activities?

Mr. HOLLIS. I have, and I have some letters here I will submit to the committee that you can put into your files that have been documented and notarized stating that they do believe the *Titanic* should be preserved as a memorial to relatives, but it should also be opened to scientific exploration for the benefit of mankind, but should not be disturbed, as Mr. Ballard has said, by just scavaging or dredging, it should be done under very careful, controlled conditions and to make sure that if there are any remains that no remains be disturbed.

I bring up a point here. It has been said by scientists that saltwater would probably have a deteriorating effect where there would be no remains. I question this. Regarding the sailing ship *Vassar*, which sank in 1628, raised in 1959, in which there were remains found. There were 12 complete skeletons found in the hull.

We are not scientifically sure what happened at the bottom. I would not like to see any remains removed or moved to pick up a platter.

The CHAIRMAN. Without objection, the letters that Mr. Hollis has offered will be included at this point in the record.

Any objection?

So ordered.

[The letters follow:]

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Blue Gander

October 23, 1985

Mr. Jon Hollis
46 Chestnut Street
Whitman MA 02382

Dear Jon:

You have asked me to give you my thoughts regarding the advisability of enacting legislation to protect the sunken wreck of the *Titanic*.

The wreck should be protected because it is (1) a time capsule, and (2) a unique laboratory. The first point is self-evident. When the *Titanic* died, the legendary shipwreck of modern times was born. The trappings of an entire culture are preserved in her remains. She is -- and doubly so because of her marvelously intact condition -- a museum. And museums are not to be plundered.

My second point is equally important. The wreck of the *Titanic* is a unique laboratory: a steel shipwreck that has been on the sea floor more than seventy years at a depth of 13,000 feet. She offers the opportunity to design innovative experiments in marine biology, biochemistry, metallurgy, chemistry, and other disciplines.

The *Titanic* should be protected by international agreement. Procedures should be established for regulated exploration and photography of the wreck. The removal of samples for scientific study should be permitted. But this ought to be rigorously controlled by a system of licensing.

I hope these thoughts will prove useful to you.

Sincerely,

Peter R. Gimbel

cc: The U. S. House of Representatives,
Committee of Merchant Marine

Blue Gander, Inc., 10 East 53 Street, New York, N.Y. 10021 Phone: 212-753-9089 Cable: Bluegander, N.Y.

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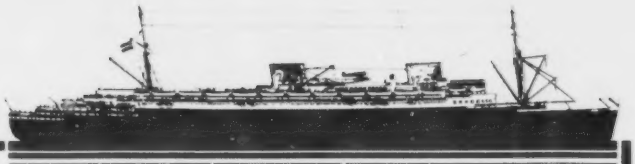

TED HINDMARSH
DEALER IN OCEAN LINER MEMORABILIA
16 CHESTNUT ROAD
HALIFAX, MA 02338
(617) 293-6617

October 28, 1985

TO WHOM IT MAY CONCERN:

As dealers in ocean liner memorabilia, we feel that the "TITANIC" should be left as a memorial to her dead.

We further feel that any research on her should be heavily licensed and limited only to photographic exploration.

As dealers, we would never sell or buy any object brought up from the "TITANIC". Anyone who would even consider such a thing is beneath contempt.

Very truly yours,

Joan & Ted Hindmarsh

Joan and Ted Hindmarsh

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THE MARINE MUSEUM | AT FALL RIVER, INC.
70 WATER STREET · P. O. BOX 1147 · FALL RIVER, MASSACHUSETTS 02722

October 24, 1985

Mr. John Hollis
46 Chestnut Street
Whitman, Mass. 02382

Dear Mr. Hollis:

The recent discovery of the TITANIC and concomitant proposals for further exploration and even salvage of the vessel are of great interest to the Marine Museum at Fall River. As you know, we have one of the largest TITANIC exhibits in the world including a 28 foot long model and photos of her during construction as well as underwater views provided by Woods Hole Oceanographic Institution. These displays generate tremendous enthusiasm and heighten the aura of mystery surrounding the nearly 900 foot long ship and the circumstances of her sinking.

The story of the TITANIC however, is much more than that of a marvelous ocean liner, or a series of human interest stories and endless second guessing. One only need listen to the recorded comments of 96 year old Mrs. Marjorie Robb, who survived the sinking yet lost her father to the Atlantic that night in April of 1912 to appreciate the pain and suffering which the sinking caused. The enormity of the tragedy still pervades her memory after 73 years, the shrieks and cries of men, women and even children who perished in the freezing waters of the North Atlantic can still be heard in her strong yet revealing voice. It is her memories which place the entire exhibit in perspective.

The TITANIC, regardless of the fascinating events surrounding her and her passengers is first and foremost a terrible tragedy, with over 1600 lives lost. The enormous grief caused by this loss is only approximated by the worst airline crashes of today, the Korean Airlines disaster perhaps the most analogous to the TITANIC. Consider the public outcry if attempts to salvage and sell portions of the airliner were made, should the TITANIC be treated differently because it sank 73 years ago?

As Director of the Marine Museum and a nautical archaeologist, I am involved in both the exhibition of materials from shipwrecks and the study and excavation of those ships. Thus, I have a very clear understanding of the dilemma caused by the need for profitability versus the desire to uphold professional and ethical behavior, as defined by often nebulous criteria. However, no such dilemma exists in the case of the TITANIC.

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THE MARINE MUSEUM | AT FALL RIVER, INC.
70 WATER STREET · P. O. BOX 1147 · FALL RIVER, MASSACHUSETTS 02722

despite the obvious boost in attendance my museum would experience by exhibiting artifacts from her. To allow commercial use of the wreck would be a flagrant exploitation of what should remain a sealed tomb and a time capsule affording an unequaled opportunity for deep sea study by the scientific community. Any other utilization would do a great disservice to those who love the sea and those who have lost loved ones to the waters of the world. To place the TITANIC on the auction block would be to put a price tag on an international treasure and would desecrate the memories of many for the benefit of the highest bidders.

I urge steps be taken to limit exploration, examination and recovery of materials to scientific and historical organizations lest a myopic and irreversible precedent be set.

Yours very truly,

Robert M. Cembrola

Executive Director

56-654 O - 86 - 2

COPY AVAILABLE

Oct 20, 1985

Dear Mr Kamuda:

I George Thomas of 4040 E. Atherton Rd

Burton, Mich.48519

Survivor of the R.M.S. TITANIC
April 15,1912;

Do herb by wish that, the TITANIC should and must remain in place at the bottom of the North Atlantic Ocean as a Memorial for those who died on the R.M.S. TITANIC.
and let them rest in peace.

Yours Truly

George Thomas

GEORGE THOMAS

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3416 North Opal Avenue
Chicago, IL 60634
October 21, 1985

Mr. Edward S. Kamuda, Secretary
SAVE THE TITANIC
T.H.S. HQS
P. O. Box 53
Indian Orchard, MA 01151-0053

Subject: **House of Representatives Bill H.R. 3772**

Dear Mr. Kamuda:

My grandmother, Caroline Horvath (nee Stanko), has asked me to respond to your letter of October 15th regarding the subject bill for her. As a Titanic survivor, she has expressed concern over disturbing the wreckage and the bodies of those entombed within. A friend of hers remains within its hull.

The initial exploration for the Titanic and the recent discovery of its location were exciting events. To know its exact location and to see actual photographs of the ship after all these years is very exciting. Beyond this point we enter a moral dilemma. What is called science or technology by some, can also be called <u>pillage</u> and <u>desecration</u> by others.

We strongly feel that the scientific and technological means of exploring this treasurer (the Titanic), will result in humankind's greed and subsequent ill-gotten gains for a handful of humanists!

We definately support a law to designate the Titanic as a maritime memorial and to protect the ship and its contents from being cannibalized in the name of research and exploration.

The sinking of the Titanic was a great historical event and had a definite impact on society. We cannot disavow this fact. However, we must <u>not</u> treat an event or object as a god as it replaces compassion and moral conscience. So much effort should be placed on praising and worshiping the God of Creation! ... what a better world we would live in and we would have richer rewards than materialistic gains.

Sincerely,

Marylin L. Powers

Marylin L. Powers
for Caroline Horvath

MLP/kas

Subscribed and Sworn
before me this 21st Day
of October, 1985.

Benedict Mayera
NOTARY PUBLIC

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October 16, 1985

To Whom It May Concern:

As the author of three volumes of maritime history, I would like to express my support for Congressman Jones' bill, H.R. 3272, and to implore his colleagues to act for the preservation of the Titanic while there is still time to prevent the great ship's depredation and commercial exploitation.

Modern technology allows us, literally, to invade history; but no one has the right to put history up for sale. The Titanic is a tomb and a reliquary. She should be granted the same status and protection that all civilized peoples extend to their memorials.

Sincerely,

John Malcolm Brinnin

John Malcolm Brinnin
Professor Emeritus, Boston University

King Caesar Road
Duxbury
Massachusetts 02332

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H.P.3272 29 OCTOBER 1965

CARGO MANIFEST "R.M.S. TITANIC"

OWNERS White Star Line I.M.M.

VOYAGE #1 CAPTAIN E. J. Smith
PURSER Hugh McElroy

Vessel call letters: MGY
Vessel official number 131428

Length of service from launch to end 120.5 days.

Length of service from completion to end 14.5 days.

PORT OF LOADING Southampton.
Also loading at Cherbourg & Queenstown.

PORT OF DISCHARGE New York

SAILING DATE 10 April 1912. ARRIVAL DATE 17 April 1912.

(c=crate,ca=cases,cs=bales,b=bags)
(bdl=bundle,bbl=barrel,hhd=hogshead)
(all=pails,tb=tubs cotton,t=tons or loads)
Fuchs Trans-Borough Corp.
Other descriptions see end of report.

CONSIGNEE (Shipper)	DESCRIPTION & CONDS. (Quantity)
Wilson & McLaughlin	1 cse Wine.
Thorer & Pratolongus	2 bbl Skins.
Carter W.E.	1 cse Mats.
Fuchs & Lang Mfg.Co.	4 cs Rubber Blankets.
Rawlings W.G. & Sons	24 cs Athletic Goods (Golf Clubs)
Park & Tilford	1 cse Toothpaste.
	5 cs Jams and Jellies.
	1 cse Hardware.
Maltus & Hare	9 cs Orchids.
Spencerian Pen Co.	4 cs Pens.
Sherman Sons & Co.	7 bls Cotton.
Claflin & Co.	12 cs Cotton Laces.
Musser Bros.	3 cs Tissues.
Isler & Gove.	4 bls Straw.
Hackman & Lassner.	1 cse Tulle.
Petro P.H. & Co.	1 cse Tulle.
Metzger A.S.	2 cse Tulle.
Mills & Gibbs.	24 cs Cottons,1 cse Gloves.
Field,Marshall & Co.	1 cse Gloves.
N.Y. Motion Picture Co.	1 cse Films.
Thorburn, J.M. & Co.	8 cs Bulbs.
Rawstick & H. Trad. Co.	26 bas Sticks.
Guiardin & Ladwick.	10 bxs Melons.

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Amer. Exp. Co.
Tiffany Co.

Lustig Bros.
Kumper P.C. & Co.

Cohen M. Bros.
Gross, Engel Co.
Hilson, P.K. & Son.
Gallia Textile Co.
Calhoun Robbins & Co.

Victor & Achilles.
Baumgarten, Wm. & Co.
Spellman Co.
Nottingham Lace Works.
Nadav & Fleischer.
Rosenthal, Leo L.Co.
Haken & McLaughlin.

Leeming T., & Co.
Crown Perfume Co.
Meadows, T., & Co.

Thomas & Pierson.

Amer. Exp. Co.

Sheldon, G.W. & Co.
Maltus & Ware.

Hempstead & Sons.
Brisch & Rothenstein.

Isler & Cuse.
Baring Brothers & Co.

Altman, B. & Co.
Stern S.
Arnold, F. R. & Co.
Schieffelin & Co.
American Motor Co.
Strohmeyer & Arpe.
National City Bank N.Y.
Kronfeld, Saunders & Co.
Richard C. B.
Corbel, M. I. & Co.
Sony's Express Co.
Van Ingen, F.H. & Co.

25 cs Mdse.
1 cask China.
1 cse Silver Goods.
4 cs Straw Hats.
1 cse Elastic Cords.
1 cse Leather
5 Pkgs Skins.
1 cse Skins.
51 cs Tulle
1 cse Lace Goods.
1 cse Cotton Laces.
1-2 cse Brushware.
1 cse Brushware.
3 cs Furniture.
3 cs Silk Crape.
2 cs Cottons.
1 cse Laces.
4 cs Cottons.
25 cs Biscuits.
42 cs Wines.
7 cse Biscuits.
3 cs Soap Perfumes.
5 cs Books.3 bxs Samples.
1 cse Parchments.
2 cs Hardware.2 cs Books.
2 cs Furniture.
1 cse Elastics.
1 cse Graphophone.
4 cs Hosiery.5 cs Books.
1 cse Linens.3 cs Prints.
1 cse Rubber Goods.
5 cs Films.1 cse Tweed.
1 cse Sero Fittings/Surtings
8 Quantity of Oak Beams.
1 cse Plants.
1 cse Pendometer.
1 Pkg Effects.2 cs Samples.
8 cs Paste.4 cs Books.
2 cs Camera and Stand.
1 cse Machinery.
15 cs Alarm Apparatus
4 cs Orchids.
30 cs Plants.
2 cs Lace Collars.
2 cs Books.
53 Pkgs Straw.
68 cs Rubber.
10 bags Galls; suspenders?.
1 cse Cottons.
60 cs Salt Powder.
6 cs Soap.
17 Pkgs Wool Fat.
1 Pkg Candles.
75 bls Fish.
11 bls Rubber.
5 cs Shells.
1 cse Films.
4 cs Hat Leather, &c
2 cs Books.
1 cse Woolens.

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H.R.3272 29 OCTOBER 1985

Lippincot, J.B. & Co.	10 cs Books.
Lazard Freres.	1 bale Skins.
Aero Club of America.	1 crate Machinery.
	1 cse Printed Matter.
Whitcombe, McGeachim & Co.	386 rolls Linoleum.
Wright & Graham.	437 casks Tea.
Illmann, J.	4 bales Skins.
Arnold & Zeise.	134 cs Rubber.
Brown Brothers & Co.	76 cs Dragons Blood.2 cs Gum.
American Shipping Co.	3 cs Books.
Adams Express Co.	95 cs Books.
Lasker & Bernstein.	117 cs Sponges.
Oelrichs & Co.	2 cs Pictures &c.
Stachert, G.H. & Co.	12 Pkgs Periodicals.
Milbank,Leamann & Co.	3 cs Woolens.
VanderGrift, F.B. & Co.	53 cs Champagne.
Downing, R.F. & Co.	1 cs Felt.1 do Meal.
	8 do Tennis balls.
	1 do Engine Packing.
Dublin,Morris & Kornbluth.	2 Pkgs Skins.
Henong, Simon & Sons.	4 Pkgs Skins.
International Trading Co.	1 cse Surgical Goods.
	1 cse Ironware.
Fitt & Scott.	4 cs Printed Matter.
	1 cse Cloth.
Davies Turner & Co.	4 cs Printed Matter.
	1 cse Machinery.1 do Picture
	1 cse Books.1 do Mdse.
Sheldon, G.W. & Co.	1 do Notions.1 do Photo.
	1 cse Elastics.2 cs Books.
	1 box Golf Balls.
American Express Co.	5 cs Instruments.
VanderGrift, F.B. & Co.	2 Parcels Merchandise.
Rudd S.	1 case Merchandise.
Lemke & Buechner.	1 Parcel Merchandise.
Nicholas, G.S. & Co.	1 Parcel Merchandise.
Walker, G.A.	1 cse Merchandise.
Adams Express Co.	1 cse Merchandise.
	4 rolls Linoleum.1 cse Hats.
	3 bales Leather.5 cs Books.
	6 cs Confectionery.
	1 cse Tin Tubes.2 cs Soap.
Wells Fargo & Co.	2 cs Boots.
	3 cs Books.2 cs Furniture.
	1 cse Pamphlets.1 do Paints.
International News Co.	1 cse Eggs.1 do Whiskey.
Van Ingen, E.H. & Co.	10 Pkgs Periodicals.
Stearns,R.H. & Co.	1 Parcel.
	1 cse Cretonne(fabric for curtains/slipcovers)Silk.
Downing, P.F. & Co.	1 cse Iron Jacks.1 do Bulbs.
Jacobson, James.	1 cse Hosiery.
Carbon Machinery Equipment Co.	1 cse Clothing.
Sander, P. & Co.	8 cse Hairnets.
Fleitmann & Co.	1 cse Silk Goods.
Rusch & Co.(Rauch?)	1 cse Tissues.
New York Merchandise Co.	1 cse Hairnets.
Blum, I.A.	2 cs Silk Goods.
Tiedeman,T. & Sons.	3 cs Silk Goods.
Costa, F.	1cse Silk Goods.

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Tolson, A.M. & Co.
Matthews, G.T. & Co.
Richards, C.B. & Co.
Tice & Lynch.

U.S. Express Co.

Papa, Chas. & Co.
Bauer, I.P. & Co. (Sauer?)
Rusch & Co.
Mallouk, H.
Randall Bros.
Heuliger, A.V.
Peabody, H.W. & Co.
Simon, A.L. & Co.
Wilson, P.K. & Sons.
Manhattan Shirt Co.
Broadway Trust Co.
Frost, G.
Young Bros.
Wimpfheimer, A. Co.
Brown Bros. & Co.
Goldrier, Morris.
Cobb, G.H.
Andjeffren Ref. Mach. Co.
Sutar,Alfred.(Sufar?)
Amer. Express Co.

Meadows, Thos. & Co.
Uecke & Heander.
Canadian Brush Co.
Johnson, J.G. & Co.
Jenkins & McCormick.
Spielman Co.
American Express Co.
Wakem & McLaughlin.
Acker, Merrell & Condit.

Enos, P.W. & Sons
Schall & Co.
N.Y. & Cuba Mail S.S. Co.

DuBois, Geo. C.
Hollander, H.
Van Rensselaer, C.A.
Brown Bros. & Co.
Bernard, Judas & Co.
American Express Co.
Mourain Wine Co.
Knauth, Nachod & Kuhne.

1 cse Gloves.
30 Pkgs Tea.
2 cs Books and Lace.
5 cs Books,1 bag Frames.
1 cse Cotton,2 cs Stationery.
1 cse Scientific Instruments
1 cse Sundries.
3 cs Test Cords.
1 cse Briar Pipes.
1 cse Sundries.
2 cs Printed Matter.
1196 bags Potatoes.
318 bags Potatoes.
1 cse Velvets.
1 cse Laces.
8 cs Laces.
1 cse Velvet.
18 bales Straw Goods.
1 cse Raw Feathers.
2 cs Linens.
3 cs Tissue.
3 cs Coney Skins.(rabbit)
1 cse Auto Parts.
1 cse Feathers.
3 cs Leather.
15 cs Rabbit Hair.
11 cs Feathers.
1 cse Tissue.
11 cs Refrigerating Machinery
18 cs Machinery.
1 cse Packed Packages.
3 cse Tissue,2 bbls Mercury.
1 Hhd Earth,2 Hhds Glassware.
3 cs Printed Matter.
1 cse Straw Braids.
1 cse Straw Hats,1 cse Cheese
3 cs Hosiery.
3 cs Silk Goods.
1 cse Brushware.
2 cs Ribbons.
2 cs Flowers.
1 cse Gloves.
18 cs Merchandise.
6 bales Cork.
75 cs Anchovies,1 cse Liquor.
225 cs Mustard.
190 cs Liquor,25 cs Syrups.
25 cs Preserves.
12 cs Butter,18 cs Oil.
2 hhds Vinegar,6 cs Preserves
19 cs Vinegar,8 cs Dry Fruit
10 bndls 2 cs Wine.
16 hhds Wine.
185 cs Wine,110 cs Brandy.
10 hhds Wine,15 cs Cognac.
100 cs Shelled Walnuts.
70 bdls Cheese.
20 bdls Cheese,2 cs Cognac.
1 cse Liquor,38 cs Oil.
107 cs Mushrooms.

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Lazard Freres.	1 cse Pamphlets.
Acker. Merrell & Condit.	25 cs Sardines.8 cs Preserves
DuBois. Geo. F.	50 cs Wine.
Heidelbach. Ickelheimer & Co.	6 casks Vermouth.4 cs Wine.
Brown Bros. & Co.	11 cs Shelled Walnuts.
1st. Nat'l Bank of Chicago.	100 bls Shelled Walnuts.
Bischoff. H. & Co.	500 cs Shelled Walnuts.
Baumert. F. X. & Co.	35 bags Rough Wood.
Erie Despatch Co.	50 bdls Cheese.
Galle. B. & Co.	5 bdls Cheese.
Rathenberger & Co.	50 bdls Cheese.
Haupt & Burgi.	100 bdls Cheese.
Sheldon & Co.	50 bdls Cheese.
Percival. C.	10 bdls Cheese.
Stone. C.D. & Co.	50 bdls Cheese.
Phoenix Cheese Co.	30 bdls Cheese.
Petry. P.H. & Co.	30 bdls Cheese.
Reynolds & Dronig.	10 bdls Cheese.
Fougera. E.	15 bdls Cheese.
Munroe. L. & Co.	41 cs Filter Paper.
	22 cs Mushrooms.15 cs Peas.
	8 cs Beans.13 cs Peas.
	10 cs Mixed Vegetables.
	25 cs Olives.12 bdls Capers.
	10 cs Fish.20 cs Mdse.
Austin. Nichols & Co.	25 cs Olive Oil.
	14 cs Mushrooms.

Order-14 cs Fuctice.19 do Gum.14 casks Gum.
225 casks Tea.3 bls Skins.4 cs OPium.
3 cs Window Frames.8 bls Skins.8 Pkgs Skins.
1 cse Skins.2 cs Horse Hair.2 cs Silk Goods.
8 bls Raw Silk.6 Pkgs Hair Nets.200 Pkgs Tea
246 cs Sardines.30 rolls Jute Bagging.
1961 bags Potatoes.7 cs Raw Feathers.
10 cs Hatters Fur.3 cs Tissue.1 cs Rabbit Hair.
31 Pkgs Crude Rubber.7 cs Vegetables.5 cs Fish.
10 cs Syrups.2 cs Liquors.
150 cs Shelled Walnuts.15 bdls Cheese.
8 bls Buchu.2 cs Grandfathers Clocks.
2cs Leather.....

Holders original Bill of Lading.
19 bls Goat Skins.15 cs Calabashes.5 bls Buchu.
4 cs Calabash Bowls,3 bls Sheep Skins.
2 cs Embroidery.8 octs(?) Wine.
22 cs Ostrich Feathers.3 bls Skins.
38 bags Arpols.3 bls Sheep Skins

This copy of the TITANICS manifest was deliverd via Registerd Mail on the Cunard Steamship Lines MAURETANIA in New York on Friday 19 APril 1912.....
Most of above was Printed in the New York Times Sunday April 21st 1912.

Descriptions of Cargo

TOTAL = Allpox 1400 Tons

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Dra9ons Blood:The juice from the fruit of Palm trees;bri9ht red in color;used in colorin9 varnish and also used in litho9raP9hy and Photo-en9ravin9:

Ar9ols:Rau Tartar used in a9in9 wine and distillin9 li9ours also Processed into Cream of Tartar:

Factice:artificial or fake most likely artificial fur:

TOTAL VALUE OF CARGO estimated in 1912 DOLLARS=$420,000.00

COMPILED AND DEFINED BY:

M.A.R.S.
Marine Associates,Research, Salva9e & History.

46 Chestnut Street
Whitman, Massachusetts 02382 U.S.A.
Tel/(617)447 4943

Jon W. Hollis

****

END MANIFEST

next file:STORES:SERVINGWARE:& LINENS:

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H.R.3272 23 OCTOBER 1985

LARDER LIST

Vessel .....R.M.S. TITANIC

Owners.....White Star Line I.M.M.

Sailing Date and Port
10 April 1912/SOUTHAMPTON

Destination Date and Port
17 April 1912/NEW YORK

Voyage Number.....01W

ON BOARD PROVISIONS

Head Chef.....L. PROCTOR

FRESH MEAT	75,000 POUNDS
POULTRY	25,000 POUNDS
FRESH FISH	11,000 POUNDS
SALT AND DRIED FISH	4,000 POUNDS
BACON AND HAM	6,000 POUNDS
SAUSAGES	2,500 POUNDS
FRESH EGGS	15,000
FRESH MILK	1,500 GALLONS
FRESH CREAM	1,200 QUARTS
CONDENSED MILK	600 CASES
FRESH BUTTER	5,000 POUNDS
FLOUR	250 BARRELS
SUGAR	5 TONS
SALT, BLACK & RED PEPPER	QUANTITIES UNKNOWN
CEREALS	10,000 POUNDS
POTATOES	40 TONS
ONIONS	2,500
LETTUCE	7,000 HEADS
FRESH ASPARAGUS	900 BUNDLES
FRESH GREEN PEAS	1,500 POUNDS
TOMATOES	3,500 POUNDS
APPLES	100 CASES
ORANGES	100 BOXES - 24,000 -
GRAPEFRUIT	50 CASES
LEMONS	50 BOXES - 12,000 -
HOTHOUSE GRAPES	1,000 POUNDS
NUTS & ALLIES	1,120 POUNDS
COFFEE	2,200 POUNDS
TEA	1,000 POUNDS
SWEETBREADS	1,000
ICE CREAM	1,750 QUARTS
ALE AND STOUT	15,000 BOTTLES
WINES	1,000 BOTTLES
SPIRITS	850 BOTTLES
MINERALS	1,200 BOTTLES
CIGARS	8,000

---END---

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H.F.3272 29 OCTOBER 1985 1

SERVICEWARE AND LINEN LIST

R.M.S. TITANIC

WHITE STAR LINE/I.M.M.

BREAKFAST CUPS	4,500
TEA CUPS	3,000
COFFEE CUPS	1,500
BEEF TEA CUPS	3,000
CREAM JUGS	1,000
BREAKFAST PLATES	2,500
DESSERT PLATES	2,000
SOUP PLATES	4,500
PIE DISHES	1,260
BEEF TEA DISHES	3,000
CUT TUMBLERS	8,000
WATER BOTTLES	2,500
CRYSTAL DISHES	1,500
CELERY GLASSES	300
FLOWER VASES	500
ICE CREAM PLATES	5,500
DINNER PLATES	12,000
COFFEE POTS	1,200
TEA POTS	1,200
BREAKFAST SAUCERS	4,500
TEA SAUCERS	3,000
COFFEE SAUCERS	1,500
SOUFFLE DISHES	1,500
WINE GLASSES	2,400
CHAMPAGNE GLASSES	1,500
COCKTAIL GLASSES	1,500
LIQUOR GLASSES	1,200
CLARET JUGS	300
SALT SHAKERS	2,000
SOUP TUREENS	500
SERVING DISHES	1,200
SUGAR BASINS	400
FRUIT DISHES	400
FINGER BOWLS	1,000
BUTTER DISHES	400
VEGETABLE DISHES	400
ENTREE DISHES	400
MEAT DISHES	400
DINNER FORKS	8,000
FRUIT FORKS	1,500
FISH FORKS	1,500
OYSTER FORKS	1,000
BUTTER KNIVES	400
SUGAR TONGS	400
FRUIT KNIVES	1,500
FISH KNIVES	1,500
TABLE AND DESSERT KNIVES	8,400
NUT CRACKERS	700
TOAST RACKS	400
DINNER SPOONS	5,000
DESSERT SPOONS	3,000
EGG SPOONS	2,000

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H.P. [illegible] 29 OCTOBER 1985

TEA SPOONS	5.000
SALT SPOONS	1.500
MUSTARD SPOONS	1.500
GRAPE SCISSORS	100
ASPARAGUS TONGS	100

----------LINENS----------

SINGLE SHEETS	15.000
DOUBLE SHEETS	3.000
PILLOW SLIPS	15.000
BLANKETS	7.500
BED COVERS	2.500
EIDERDOWN QUILTS	500
COUNTERPANES (EMBROIDERED QUILTS)	3.000
BATH TOWELS	7.500
FINE TOWELS	5.000
LAVATORY TOWELS	9.000
ROLLER TOWELS	2.500
PANTRY TOWELS	6.500
TABLECLOTHS	6.000
GLASS CLOTHS	3.000
TABLE MATTING	15.000
COOKS CLOTHS	2.500
APRONS	4.000
MISCELLANEOUS	10.000

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Becky McElroy
38 Rose Way
Randolph, N.J.
07869

November 26,

Dear Congressman Jones;

I feel that the Titanic should not be raised. It would be wrong to raise and bring back all those horrible memories of the people who survived from the Titanic and lost relatives. Also if you raise it you would most likely find hundreds of skeltons from the people who died.

If it has been proven that there is no valuables on the ship why raise it? Also, it would probably break while raising it and be even harder to find. It would take a lot of money not worth spending and also someone could get hurt with the machinery you would use. Even if there were valuables on it there would be a big fight over who would get them.

Considering all this, it wouldn't be worth raising.

Sincerely,

Becky McElroy

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Mr. BALLARD. If I could add, although the photographs, as you saw, showed the ship in what you would say is a high state of preservation, that does not mean that it has not been adversely affected by the pressure and other environmental conditions that upon touching or to begin to try to lift or move that that would not cause serious damage to the objects.

The CHAIRMAN. Are there any questions by members of the committee?

Mrs. Schneider.

Mrs. SCHNEIDER. Yes, Mr. Chairman.

I would like to know, Mr. Ballard, if you are familiar with the status of any international laws right now that have jurisdiction over research, exploration, or the salvaging of any parts of the *Titanic*?

Mr. BALLARD. No; I am not aware that there are any laws in place other than the ones that have historically dealt with ships on the high seas. I believe that unless actions are taken there will be no protective legislation in place. I think we need to move expeditiously. The *Titanic* is what we refer to as a weather window. It is reasonably safe right now due to Mother Nature's storms in that area. The weather window is generally in the summer months. I think we need to do something before next summer—July, August. But I do not believe there is anything in place.

I understand that there are ways in which the Canadians could interpret their law of the sea rulings that could extend but I really don't believe that they plan on doing that or even believe that it applies, but I am not the one to ask.

Mrs. SCHNEIDER. Do you think that we ought to define what might be permissible objects for recovery and nonpermissible objects for recovery? Are there some things that perhaps ought to be removed from the vessel for purposes of art, history, or educational purposes?

Mr. BALLARD. My feeling would be more of one there is a tremendous desire on the part of the people of the world to see the *Titanic* in somewhat of a more tangible way than the way we are presenting it to date with images. I do believe that there is a tremendous amount of material in this debris area that has no real important significance, laying scattered all over the ocean floor.

Like I say, I am in favor of the recovery of that material probably with manned submarines, to ensure that they are protected and the public and the world have the ability to touch or so to speak, and feel the ship. But the ship proper, I don't think that there is any economics in trying to bring it up intact. As I say, it is missing a large part of the stern. I don't think it would survive a salvage operation. A lot of what is beautiful about the *Titanic* is its woodwork and a lot of interior parts of the ship, as opposed to an object you could pick up.

The rooms themselves, as you saw on some of the slides, are beautiful rooms and I suspect a reasonable percentage of those will be in a very high state of preservation. To go down there and try to cut up the rooms and bring them up, I think it is economically insane. I think there are people who may want to throw money away, that can happen. You can go out and throw money away. It may not be economical, you can still go ahead and do it, and I hope

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that the economics are tough enough nowadays to stop people from throwing money away.

I believe the ship proper should be left where it is.

Mrs. SCHNEIDER. So, that is where you would draw the line?

Mr. BALLARD. I would draw the line between the ship itself——

Mrs. SCHNEIDER. And the debris?

Mr. BALLARD. Yes.

Mrs. SCHNEIDER. Thank you very much.

Thank you, Mr. Chairman.

The CHAIRMAN. Anybody on this side?

Mr. ANDERSON. Thank you, Mr. Chairman.

My initial question was with regard to the disposition of the *Titanic*. Mr. Ballard, if it was up to you what would you do with the shipwreck? I think both of you made your position very clear. It is a very, very controlled disposition.

I was looking at section 5 here, the national guidelines. It says the administrator shall develop guidelines to govern research, exploration, and if appropriate, salvage of the shipwreck *Titanic*, which are consistent with its historical and cultural significance, as well as the purpose and policies of this act.

Second, to promote the safety of individuals involved in the operation.

And third, to recognize the sanctity of the shipwreck *Titanic* as a maritime memorial.

In developing these guidelines the administration shall consult with other interested Federal agencies, academic and research institutions, and members of the public.

It goes on, internationally, the Secretary is directed to enter into negotiations to develop international agreements which provides for the international research, exploration, and appropriate salvage of the shipwreck *Titanic*, consistent with the guidelines developed pursuant to section 5.

We are back to what I think you gentlemen both expressed. Aren't you in support of this provision?

Mr. BALLARD. Yes; I would replace the word "salvage" with "recovery." I think it has a better meaning, that you are not breaking it up for economic purposes. I have to resort to the dictionary to find out whether salvage implies commercialization, which we are not in favor of, but recover certainly we are in favor of.

Mr. ANDERSON. It seems like you are going to academia and research institutions and groups to get all that consultation before, and it seems that plans are going to be pretty extensively reviewed before they even enter the operation. It looks to me like they are covering the points you have made.

Mr. BALLARD. I am in support of the bill as it is written.

Mr. ANDERSON. Thank you, Mr. Chairman.

The CHAIRMAN. Mr. Studds.

Mr. STUDDS. I don't have any questions. I just want to welcome these two citizens of Massachusetts and in particular, my perhaps currently most reknowned constituent, Dr. Ballard from Woods Hole.

I want to say officially what I said personally; it is not an easy transition for anyone to go from ones hands and knees on the bottom of the ocean with a flashlight into the spotlight of the world

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media. I hope for your sake you don't have to do it very much longer. I assume you are going back to the bottom of the ocean?

Mr. BALLARD. As soon as possible.

Mr. STUDDS. I can only imagine your trip to Washington has contributed to your eagerness to do that.

I noted your distinction between C-Span, its coverage of our activities, and your camera, its coverage of the ocean. I wasn't sure where your phrase "boring organisms" came in at that point. I think the message is well taken.

You also speak with a fluency that generally does not characterize your profession or ours. I really appreciate that.

Mr. BALLARD. It does not come from crawling on your hands and knees.

Mr. STUDDS. It may not be good for the back but it definitely is good for the soul, and I appreciate what you have done.

Thank you.

The CHAIRMAN. Anybody else wish to be heard?

Mr. HUGHES. Thank you, Mr. Chairman.

I, too, want to echo the sentiments of my colleague in congratulating Dr. Ballard.

I only have one question. You indicated how Great Britain feels about the site as well as France. How about other countries, how do they feel about what should be done with the site?

Mr. BALLARD. Well, we have received a lot of letters I can't read because I can't read all of the languages, but all of the letters that we translated and communicated with other countries it is a——

Mr. HUGHES. Are those letters from southern New Jersey?

Mr. BALLARD. I can understand that language. But from Germany and other countries, tremendous interest.

Mr. HUGHES. How many other countries really have the capability at this point of reaching the site?

Mr. BALLARD. Well, any country with money can purchase the capability. I think that it is more important than who actually mans the ships.

Mr. HUGHES. Basically, even though the technology might have been developed in certain countries, basically any other country that has the inclination and the money could reach the site?

Mr. BALLARD. Yes—not wanting to insult any, if I could give a partial list—Canada, Japan, Great Britain, France, Germany, and you could go on, as sufficient amount.

Mr. HUGHES. I think that points up precisely why we should make that an international endeavor at this point, even though we can't reach extraterritorily. I think Mr. Hollis' suggestion of an amendment that would provide limited importation of artifacts into this country is only a partial solution to the problem. What we need to do is get an international accord in setting this site aside.

Mr. BALLARD. I think the only reaction I would have is one wants to see it in place or some degree of emplacement as rapidly as possible, and I am sure you are greater experts at how you get one person to agree with himself and then start adding people.

Clearly if we can begin in America and quickly with France, England, and Canada--I might add Portugal is a fairly important country that supports the Azores or the base of operations we used to support our expedition, and I would include them. Not that they

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have the same technology, but they certainly are positioned in an important place. As quickly as possible to other countries, as opposed to trying to get every country in the world to agree immediately.

Mr. HUGHES. Thank you very much.

The CHAIRMAN. Mr. Bosco.

Mr. BOSCO. Thank you, Mr. Chairman.

I have one question, I think for Dr. Ballard.

I certainly understand what the historical significance is and perhaps the value of commemorating that site for those who died there, but what would the *Titanic* represent in terms of scientific importance? In other words, if it wasn't there or in other areas you could just as well study the ocean and the ocean bottom and the currents and those kinds of things that we are familiar with in terms of scientific discovery, but what is the scientific value of the *Titanic* being there and what contribution does it make to science being there as opposed to say being salvaged?

Mr. BALLARD. You would have to actually get specialists in the different disciplines of oceanography. I am an Earth scientist and geologist. Clearly it is an area that is now an obstacle to movement and sediments. It could be an interesting object. We know exactly when it was placed there, and one could learn a great deal about the creation of bed forms and other things like that.

To biologists it has other meanings. Clearly the presence of wood introduced into the environment, there are a lot of scientists that go to a great deal of trouble to go down in a submarine and stick wood into the bottom at a very high cost. Here you have a whole myriad of materials that have been now introduced into the deep and their subsequent interaction with the environment are of interest chemically as well.

There are a number of people who are already contacting me about return trips for scientific research. I am confident that the engineering and scientific community will want to now return to the *Titanic* for a number of legitimate reasons. How you weigh that as far as I am concerned, that is what you guys or gals are supposed to do, is to weigh the pros and cons of how important marine biology, chemistry, geology, and history are to commercialization. But there are definitely scientists who are not interested in returning to it to conduct a number of experiments.

Mr. BOSCO. Is there scientific material that the *Titanic* would present that isn't available elsewhere in terms of shipwrecks and any number of other——

Mr. BALLARD. I am not aware——

Mr. BOSCO. Found on the ocean bottom?

Mr. BALLARD. I am not aware of other than a few ships that we have placed into the deep sea fairly recently for disposal of material, of that many well documented ships in 13,000 feet of water that sank 70 some years ago. We have put a lot of objects down there since then but fairly recently. I am sure the technology is going to begin yielding more and more ships. Now there aren't that many that have been documented.

Mr. BOSCO. Thank you very much.

The CHAIRMAN. Mr. Franklin.

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Mr. FRANKLIN. I want to congratulate Dr. Ballard for this discovery. Could you tell me, sir, how was the effort funded that led to the discovery?

Mr. BALLARD. There were two organizations that were really involved and the thanks you give me should also be extended to my colleagues who were equally responsible. The French Government—probably if you were to add up the dollars and cents spent—spent more money on the *Titanic* expedition. That is the French Eframire that used to be known as the Conexso, is a government agency involved in deep sea exploration, sort of their equivalent to NOAA, but in the case of France it is pretty consolidated, much more consolidated than the United States. Mostly French contribution.

The major contribution in our part came from the U.S. Navy. The U.S. Navy developed, funded our development of the Argo vehicle system, and we were exercising the vehicle system, testing it. It was the first chance we had to go to sea with it. Our motivation, as I said before, is not to go around the world looking for historical shipwrecks. Our goal is to get to see as rapidly as possible—I hope in a few weeks—with Argo, to do our first scientific expedition on the East Pacific Rise. So our motivations were really in developing a new generation of exploration tools for scientific research and support of the Navy.

Mr. FRANKLIN. If we allowed recovery of some of the artifacts that are there, as you said for scientific purposes or historical purposes, how would you suggest that that effort be funded? If we are to undertake that here in the U.S. Congress——

Mr. BALLARD. Like I say, as presently planned, the French will probably put more into it next year than us, if we even put in any effort. They are going to go there and mount a rather impressive effort. Whether we do it or not, how that is funded, I think it is really up to our sponsors, the Navy, as to whether one can do that or not.

I don't think the Navy itself is terribly interested in the recovery of items for any purpose of the nature we are talking about. I don't know if there are ways in which sponsors of museums or whatever could pay for some of the dives. I don't know if the dives are available. Alvin is a national facility controlled by a review committee that determines its differing agenda. I don't know even if dives are permissible this year for recovery of material, but clearly a few dives, four or five dives are conceivable. I would think for any purposes that leads to recovery of material should probably be paid for by museums or however is going to use the material.

Mr. FRANKLIN. Thank you, Dr. Ballard.

Thank you, Mr. Chairman.

The CHAIRMAN. Mr. Tallon, do you have any questions?

Mr. TALLON. No, Mr. Chairman.

The CHAIRMAN. One final question, please, sir.

You have mentioned the investment which the French nation had in this exploration as well as others. Do you have any feeling—or you may have answered this—what is the French reaction to this type of approach of international conference to set up guidelines?

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Mr. BALLARD. I believe in talking to my French colleagues—I have not talked to the French Government per se—our lines of communications have always been colleague to colleague, and I know that my co-chief scientist on both expeditions, while we were out there, called home and spoke to his wife just as the discovery was made and the reaction he told me personally was one of deep concern of desecration with the common Frenchman.

I think it is a universal reaction that is occurring and I know that the French are very sensitive to this, and I feel that they will proceed in a very tasteful way as well.

The CHAIRMAN. Thank you.

That makes me very happy. Personally I am getting an international consensus that quite often I can't get in this committee.

Mr. BALLARD. It is nice.

The CHAIRMAN. Be that as it may. Well, thank you and Mr. Hollis for your presence here this afternoon. You certainly made excellent witnesses and I thank you both for your support for this particular legislation.

Thank you very much.

Mr. BALLARD. Thank you very much.

The CHAIRMAN. Our next witness is a very charming lady. I had an opportunity to chat with her before the committee convened. She is from Milwaukee and I asked her about beer. She said she didn't bring any. I have forgiven her for that. She is a very charming lady, one I think you will enjoy hearing as she testifies about her very tragic situation. She is one of the survivors of the *Titanic* when it sank in 1912.

It is with much joy and happiness and a great deal of appreciation that I present to the committee Mrs. Louis Pope of Milwaukee, WI.

STATEMENT OF LOUISE POPE, SURVIVOR OF THE "TITANIC," FROM MILWAUKEE, WI

Mrs. POPE. Thank you very much, Mr. Chairman, and the rest of the committee.

Although I was 4 years old, all that I remember of that night is the cotton blanket which was wrapped around me and the shoes that were on my feet.

My mother told me that the collision had jarred us from our bed, and that father left us to look for his younger sister and brother who had been assigned to separate areas of our third-class section. She said that he couldn't find them and that when he came back all of the people were ordered to go on deck.

My mother and I were in the second to the last lifeboat and she told me that although the boat was little more than half filled, the officials were in a hurry to lower it and when they began lowering it, my father jumped in. She said there was room for many more people in the boat and that the water was cold.

I think my father's sister and brother, like others who died in the *Titanic* would say "Do what you want with the ship as long as what you do benefits all people."

I feel that if research and salvage of the *Titanic* will benefit all people, then such activities should be encouraged.

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My folks were emigrating from Europe to make a better living in Milwaukee. We had an aunt and uncle living there. That is where the destination was, but it didn't turn out that way.

That is all I have to say.

The CHAIRMAN. Well, Mrs. Pope, thank you very much, and certainly we don't want to cross examine you. I would like to explore one or two of your thoughts. As a survivor of this great disaster, what was your first thought upon hearing of the discovery of the *Titanic,* and now what is your general reaction to the discovery? Are you delighted that it was discovered or do you feel relieved, or——

Mrs. POPE. I do think that if there is any benefit for research I would be one willing to see it done, but not commercially. Have the museums, if there is anything there that can be put in a museum, I think it would be grand, but to salvage, I don't know.

The CHAIRMAN. One final question. How do you as a survivor with relatives who perished, feel about the possibility of extensive salvage of the *Titanic*, such as an attempt to raise the vessel, and do you have anything to say to those who have plans for salvaging the *Titanic*?

Mrs. POPE. I do not like the benefit of salavaging for commercial purposes, but if they can use it for research or something on there for museums, I would be more than willing.

The CHAIRMAN. Thank you very much.

Any members have any questions of Mrs. Pope?

I would like to thank you for your presence here today and assure you that you have made a very fine witness and contributed much to that which we are discussing.

Mrs. POPE. Thank you.

The CHAIRMAN. Our next witness is Mr. Jack F. Grimm, owner, Grimm Oil Co., Abilene, TX; accompanied by John P. Lee, attorney and William B.F. Ryan, associate professor, Lamont Doherty Geological Observatory, Columbia University.

You may proceed, sir.

STATEMENT OF JACK F. GRIMM, OWNER, GRIMM OIL CO., ABILENE, TX, ACCOMPANIED BY JOHN P. LEE, ATTORNEY; AND WILLIAM B.F. RYAN, ASSOCIATE PROFESSOR, LAMONT DOHERTY GEOLOGICAL OBSERVATORY, COLUMBIA UNIVERSITY; AND JOHN BENTLEY, ATTORNEY

Mr. GRIMM. Thank you, Mr. Chairman.

This is John Bently, attorney, on my left, and one of my associates in the last expedition to look for the *Titanic*, and on my right is Dr. William B.F. Ryan from Lamont Doherty Geological Observatory of Columbia University, one of the more prestigious oceanographers of our day. He was involved in all three of our expeditions to look for the *Titanic.*

First, I want to thank you for giving me the opportunity to appear before this committee. The House bill 3272 presented to Congress by you, Mr. Chairman, is certainly a fine tribute to the memory of the 1,500 people who died when the *Titanic* hit the iceberg on the night of April 14, 1912.

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My associates, of which 14 are engineers or geologists, and I, are fully supportive of the bill, except for one major part, where the bill is proposing to restrict access to the wreck by any person or nation without prior Government approval and situation.

Let's go back in time some 5 years, to when I first announced plans to search for the *Titanic*. At that time, research and exploration of the deep oceans was limited. A research ship of a special kind was needed, as well as a deep water sonar and a deep water camera system. Also a crew of experienced oceanographers. A contract was entered into with Dr. William B.F. Ryan of Lomont Doherty Geological Observatory of Columbia University and Dr. Fred Spiess of Scripps Institution of Oceanography.

Dr. Ryan proposed building a new side-scan sonar and a new camera sled with a video tape camera and three 35 millimeter still cameras. Therefore, with free enterprise funds, some $400,000 was budgeted by me for the building of the systems. They are now the state of the art for deep water research. The U.S. Navy has now ordered one for the NRI sub. The French copied our design of the sonar and Woods Hole copied our design of the camera system with our approval. Woods Hole didn't do all this by themselves. We had done several years of research in state of the art camera systems and sonar systems and Dr. Ryan willingly and forthrightly furnished all the data of our system so the French could make a copy of the sonar and Woods Hole could make a copy of the camera system, now called Argo, which is nothing but a modification of our camera system that was designed in 1980.

We donated both systems to Columbia University and Dr. Ryan assisted the French and Woods Hole in building their own systems. So the Argo camera system used this summer was nothing new, but was a copy of our system that had been in operation for nearly 5 years. The same is true of the French sonar.

Our sonar and camera systems have been in continuous use by several U.S. Government agencies, the National Science Foundation, U.S. Geological Survey, National Oceanic and Atmospheric Administration, Department of Energy, and Office of Naval Research.

The systems have been sued by the French, Italian and Canadian Governments. This equipment has seen service in the Pacific, the Atlantic, the Gulf of Mexico, and the Mediterranean. Some 12,000 square miles have been surveyed with our equipment, so we too have made a contribution to our Government and to ocean sciences as well.

We have been to the *Titanic* site three times, 1980, 1981, and 1983. In 1981 we staked our claim to the *Titanic* by setting navigational transponders on the ocean floor in the area southeast of the traditional SOS fix. During the last 3 hours we were on location in 1981, our cameras filmed one of the *Titanic* propellers, standing upright in the ocean, some 4 to 5 feet off the ocean floor, which meant the prop was still attached to the shaft and to the ship. Our charter had run out on the *Gyre*, Texas A&M's research ship, therefore, preventing another pass over the wreck. In 1983 we returned to the site, but due to bad weather, we were unable to recover our film and tape of the wreck. The next step would be to dive on the *Titanic*, not to raise it. The press continually confused

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our expeditions with the film that came out, "Raise the Titanic," It came out the same summer, the first summer we went out in 1980.

Plans are underway to contract the well known *Aluminaut*, a 50 foot aluminum sub carrying a crew of up to eight men to dive on the wreck in 1986 or 1987, whenever it has been recertified. It is the first submarine ever built made of aluminum. It has 6½ inch walls. If you may remember, it is the sub that was reactivated to find an atomic warhead off the coast of Spain when two airplanes collided. One bomb landed in a farmer's garden and the other landed in the ocean and it was recovered by the same submarine.

Also the *Alban*, which is operated by Woods Hole sank in some 7,000 feet of water and the *Aluminaut* was reactivated to recover the *Alban* and they did it on the first dive.

This project has been quite an investment for my group and to put restrictions on us at this time would be devastating. It is costing in excess of $1 million to recertify the *Aluminaut*, but what good would it be to reactivate it if we are prevented from using it?

Another important point I wish to make is that the *Titanic* is resting in 12,500 feet of water, some 1,000 miles east of Boston. It is in international waters, well off any shelf area or shelf slope. It is also beyond the 200-mile limit of any country's shoreline. Any law that we might try to pass only restricts the citizens of the United States. There are several other countries that have submersibles that can go to 12,500 feet. If we are lucky and funds are available, we do dive, we might be lucky enough to recover some of the debris on the ocean floor. What possible harm can that do to this mass of twisted steel?

The Smithsonian Institute and other naval museums have expressed an interest in any artifacts we might recover. I have made a specific effort to share our information with the world, as the *Titanic* story has captivated millions and it continues to be the first in the news. Our plan was to film the dive and share it with the world and any artifacts that we recovered, make them available to institutions like the Smithsonian Institute.

I also have talked to or met six of the survivors of the *Titanic* and they approved what we were doing. Their only request was not to raise it. We never considered doing that.

Does the United States want to get into the salvage business? One of the last times that was tried was for the search and recovery of the Russian sub in the Pacific in some 15,000 feet of water. I understand that before it was all over, upward of $1 billion of taxpayers' money was spent. Do you want to spend up to $1 billion to recover some artifacts and debris from the *Titanic*? I hope not.

Thank you.

The CHAIRMAN. Thank you.

Dr. Ryan, you are recognized.

STATEMENT OF WILLIAM B.F. RYAN

Mr. RYAN. The *Titanic* lies beyond what would be referred to as the exclusive economic zone of either the coastal States of the United States or Canada. There were concerns in 1980 when Mr. Grimm began his project that the *Titanic* wreck site might qualify as being within the exclusive economic zone of Canada, based on

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article 76 of the Law of the Sea Conference. There is a clause in the Law of the Sea Conference referred to as the Irish formula which allows for extension beyond the 200-mile limit based on argument of sediment thickness leading exploration in terms of oil and gas interests, and so Mr. Grimm spent some sizable amount of his money—he and his investor—to carry out seismic experiments which measured sediment thickness of the *Titanic* site and shows this is not thick—the thickness is not sufficiently large to qualify this in the exclusive economic zone of the United States.

In the 1980 and the late 1970's, prior to the project that Mr. Grimm and several U.S. corporations were carrying out exploration activity on the floor of the Pacific Ocean in search of manganese nodules, in fact on the ship *Global Explorer*, under the cover of Howard Hughes and his enterprise, was supposedly looking for manganse nodules when in fact it was trying to recover a Russian submarine. The position then of the U.S. Government, particularly the Department of Commerce, which had the Office of Ocean Mining, was that the activity of the private enterprise beyond the 200-mile limit would be grandfathered, since there was no governing body to which one could file mining claims.

In 1980 and 1981, Mr. Grimm proceeded in the same manner as the mining industries by carrying on the work, spending money, publishing the work, and laying markers on the ocean floor that would show the area to which he had done his work.

It was the intention that this would be essentially respected by the U.S. Government, it wouldn't be an enterprise that any form of regulation would be taken away from him or his investors.

Thank you.

[The statement of Mr. Ryan follows:]

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Statement of William B.F. Ryan, Lamont-Doherty Geological Observatory, Columbia University in the City of New York

Summary

A review is presented whose purpose is to show that private enterprise corporations, incorporated in the State of Texas in 1980, 1981 and 1983, have been involved since 1979 in activities related to the location and documentation of the wreck site of the *Titanic* on the floor of the North Atlantic Ocean. The cumulative investment of these Texas corporations approaches $2,000,000.

The Texas corporations have conducted their work at sea with high professional standards. The corporations entered into contract with prestigious universities and oceanographic institutions which provided the technical expertise. The investigations have been comprehensive and multi-disciplinary, encompassing the systematic mapping of a 600 square nautical mile area of the ocean floor in water depths of 3600 to 4100 meters (11,800 to 13,500 feet).

Through the investments of these Texas corporations new deep sea exploration technology has been made available to the academic community, to the oil, gas and mining industry, and to agencies of the United States Government involved with the study of the ocean and regulation of exploration activity for natural resources.

All geophysical data collected by the activities of the Texas corporations have been placed into the public domain without delay. The public has been kept well informed of the progress of the search through press conferences, press releases, publication of a book, release of a documentary film, and publications in scientific and technical journals. Numerous articles have appeared in the press announcing past accomplishments and future intentions.

Preliminary agreements have been arranged for the delivery of recovered objects to national museums and other maritime museums. Salvage of the wreck for resale of its materials and cargo is not a goal of the Texas corporations. Recovery of some objects for historic and laboratory analyses is considered to be a requirement for thorough scholarly documentation of the wreck and is necessary to shed new light on circumstances surrounding the needless tragedy which took place on April 14 and 15, 1912.

Careful attention has been paid to issues of legal jurisdiction by the Texas corporations. Each expedition sought advice through formal channels from the U.S. Department of State regarding clearances for U.S. registered ships to work in the wreck site area. The *Titanic* rests on seabed that is beyond the 200 nautical mile limit from the coast of either the United States or Canada. Thus, the wreck site lies outside of the Exclusive Economic Zone of any coastal state as defined by Article 76 of the Law of the Sea Convention of the United Nations.

Claims of the Texas corporations for near-term future study and salvage rights within the 600 square nautical mile search area have been promulgated. Nine separate markers were deployed on

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the seabed in the search area. The precise locations of these markers were identified on published maps which also show the tracks of the survey ships and vehicles towed near the ocean floor. These maps have been published both in the United States, under whose law the corporations abide and in England, where the White Star Line (owner of the *R. M. S. Titanic)* was registered.

Plans to use a submersible (*Aluminaut*) for recovery and further visual observations were announced at the initial project press conference in April 1980 and most recently in a magazine article of Delta Airlines in the spring of 1985.

The Texas corporations agree that the wreckage of the *Titanic* should receive some sanctuary status in order to discourage plunder of its cargo and desecration of the memory of more than 1500 men, women and children who lost their lives in the tragic sinking.

This report questions whether a bill of Congress enacted into law is the appropriate vehicle for establishment of a sanctuary status. Regulation of a parcel of seabed by the United States outside of its Exclusive Economic Zone would have international repercussions. A precedent, in the case of the *Titanic*, no matter how noble the intention, would not be in the national interest .The precedent could introduce serious complications for freedom of scientific research as well as for future oil, gas and mining activities of U.S. companies in international waters that properly come under the jurisdiction of the Law of the Sea Convention and its regulating body. The precedent could create a threat to national security by giving recognition to other non-friendly nations who make claims to control the seabed outside of their Exclusive Economic Zone. Such nations could also claim a bogus sanctuary in international waters where their ships have sunk, potentially near the 200 nautical mile limit of the United States or her allies.

Claims of regulatory authority by the United States over seabed considered at present to be in the international domain could be regarded abroad as naive and possibly offensive by foreign governments and public opinion.

In the United States technological leadership in the offshore resides dominantly in industry and the universities whereas in other countries oceanographic expertise is found almost exclusively in national laboratories and agencies. The Texas corporations view the present U.S. policy that permits free access by industry to the deep sea as an advantage. Regulation of future investigations at the *Titanic* wreck site by U.S. law would be discriminatory to U.S. citizens and corporations since these laws would not necessarily be upheld by other countries. Enactment of House Bill 3272 in its present form could be a signal to private enterprise to move investments outside of U.S. jurisdiction where activity would be secret and exclusive.

House Bill 3272 speaks against the philosophy of the Reagan administration because it favors programs sponsored and regulated by the Federal Government against programs of U.S. private enterprises in which there has been no irresponsible circumstance to warrant regulation.

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Project Guidelines

The long-term effort, funded by the Grimm Oil Company, Titanic '80, Inc., Titanic '81, Inc. and Titanic '83, Inc., to search for, identify and document the wreckage of the *Titanic* on the floor of the North Atlantic Ocean has been consistently carried out with a thorough respect for appropriate scientific procedures, with new innovative technology, with attention to relevant historical and legal issues and with the public and national interest in mind.

Project Conception

The initial concept of producing and marketing a documentary and educational film of the "Search for the *Titanic*" was brought by Expeditions International, Inc. to Jack F. Grimm in 1979 with the objective of securing sufficient funding and organizational structure for an expensive sustained effort. A brief public announcement of the impending project was delivered in December 1979, was carried by the Associated Press and UPI wire services and was reported in the "New York Times".

Project Incorporation

A corporation was established by a group of investors in the state of Texas under the title of Titanic '80, Inc. in order to finance, strategically plan the search expedition and contract for services, charters, public relations, film production, book publication and magazine rights.

Titanic '80 was funded entirely from the private sector with no co-mingling of resources contributed by state or federal agencies. The investor group included individuals with businesses that are closely related to geological and geophysical exploration. The businesses and individuals had legitimate interest in new oceanographic technology, survey procedures in the deep sea, and exploration rights for subsea lands that lie both within and beyond the Exclusive Economic Zone of coastal states. It is significant to note that Titantic '80 Inc. was structured in 1980 before ratification of the Law of the Sea Convention of the United Nations, a document as yet unsigned by the United States. However, the corporation was familiar with Article 76 of the negotiating text which referred to the limits of coastal state jurisdiction and the realm of the high seas.

The budget for the 1980 program was estimated at $750,000. All the funds were raised from private sources so that no aspect of this high risk project would be supported by the U.S. taxpayer.

Project Team

In order to assure that the at-sea search activities and pre-search historical and legal research would be pursued with the highest professional standards, Titanic '80, Inc. contracted with Columbia University in the City of New York and with the Regents of the University of California to supply technical direction and expertise. The contract with Columbia University was entitled "Near Bottom Geophysical, Geological and Photographic Survey of the Continental Margin Southeast of Newfoundland in the North Atlantic". This contract directed the University's Lamont-Doherty Geological Observatory to develop "near bottom acoustic techniques and instrument systems" in order " to locate the wreck of the *Titanic*". The contract specified that these systems would include "an acoustic towed survey vehicle which includes side scan sonar... acoustic navigation ... a profiler ... a magnetometer" and " a second tethered vehicle with ... high capacity deep-sea cameras ... and a video system... with video signals telemetered in real time to the surface vessel and displayed on video monitors". The contract stipulated that the "approximately 5-week sea expedition...will intensively study an area about 30 miles (55 kilometers) on a side at depths between 3600 and 4100 meters (11,800 and 13,500 feet)... to produce detailed bathymetric, acoustical reflectivity, magnetic anomaly and navigation maps". The contract further stated that title to the equipment fabricated and purchased by Columbia University will "vest in Columbia

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University immediately upon acquisition and/or fabrication" so that this capital investment could be used for the advancement of fundamental research. It was agreed that "Columbia University will be free to publish the results of the research without restriction". Lamont-Doherty Geological Observatory was chosen because of its reputation in oceanographic research and because of its past demonstrated ability to locate the wreckage of the U.S. Navy's Nuclear Submarine *Thresher* with a near bottom magnetometer and remote cameras in great water depths beyond 2000 meters (6500 feet).

The purpose of the contract with the Regents of the University of California was to obtain the expertise of the Marine Physical Laboratory of the Scripps Institution of Oceanography, University of California, San Diego and in particular to obtain Dr. Fred N. Spiess, past director of the Laboratory as a key member of the project team. The contract with the Regents of the University of California provided for use of a portable deep sea winch and a 30,000 foot coax tow cable owned by the U.S. Navy and operated and maintained by the Marine Physical Laboratory. Dr. Spiess chaired in 1980 a committee of the Navy concerned with deep submergence technology. He headed a blue-ribbon review panel for the Navy following the loss of the *Thresher* whose purpose was to recommendand implement new deep sea technologies for search and recovery. His research team was judged by Titanic '80, Inc. to be the most experienced and qualified in deep tow operations using long electrical umbilicals, side-looking sonar and acoustic navigation. Dr. Spiess was given the task of directing all aspects of the field program while the expedition was at sea.

A guest scientist and engineer from the U.S. Geological Survey, Menlo Park, California were provided accommodations on a no-cost basis so that they could test new acoustic navigational equipment to be used later for U.S. government projects.

Project Equipment

Titanic '80, Inc. contracted with Colmek Systems Engineering in Salt Lake City, Utah to design, build and ptovide at-sea support of a black & white deep sea television system according to specifications mutually agreed upon between Colmek Systems Engineering and Lamont-Doherty Geological Observatory. This small Salt Lake firm had built the deep sea video systems used by Deep Sea Ventures, Inc. in the exploration for manganese nodules. This company also had built the telemetry systems on the Sedco Drillship used in the feasibility tests for proto-type deep sea mining. Some Titanic '80 Inc. investors represented mining and oil and gas interests.

Lamont-Doherty Geological Observatory collaborated with International Submarine Technology, Ltd., Redmond, Washington for the design and fabrication of the mid-range, deep-towed side-looking sonar, called Sea MARC I.

Lamont-Doherty Geological Observatory designed and implemented a short-baseline acoustic navigation system, the first of its kind used for tracking vehicles on long tetners at full ocean depth.

Approximately $250,000 was invested in the initial equipment purchases and instrument development.

Project Survey Ship

Titanic '80 inc. contracted with Tracor Marine, Inc. of Austin Texas for a 37 days at sea charter of the geophysical research vessel *H. J. W. Fay* at a cost of approximately $300,000. This 175 foot vessel was originally built for a major oil company and carried a U.S.C.G. Certificate of Inspection and is classified +A1 (E) by the American Bureau of Shipping. The *H. J. W. Fay* was mobilized from and returned to Ft. Lauderdale, Florida. Unlike academic research ships this vessel belonged in the private sector, yet on several occasions it had been leased to the U.S. Geological Survey and the U.S. Navy for oceanographic surveys and specialized instrument deployments.

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Project Public Relations

Titanic '80, Inc. contracted with the William Morris Agency in New York to represent the corporation in marketing and to assure wide and orderly public dissemination of information throughout pre-cruise, at-sea and post-cruise period. Several hundred persons including all the major New York TV networks attended a press conference which was held at the Explorers Club in New York on April 12, 1980. At this time all aspects of the impending field program were revealed. Details of the equipment to be used and the search strategy of the expedition were published in the "Science Times" section of the New York Times. Members and officers of the Titanic Historical Society attended this conference and communicated their recommendations and concerns to the expedition members from Lamont-Doherty Geological Observatory. The expedition carried the Explorers Club flag, which has been on the moon, both poles and atop Mt. Everest.

1980 Expedition Results

The results of the field program which took place in July and August, 1980 have been summarized in identical final reports, entitled "The Search for the *Titanic*" submitted in November 1980 by Lamont-Doherty Geological Observatory and Scripps Institution of Oceanography to Titanic '80 Inc. and to the Office of Naval Research (Code 420), Arlington, Virginia.

Highlights of the expedition were the location of 14 possible targets, the mapping of 600 square miles of deep-ocean seafloor, the successful operation of the mid-range side-looking sonar and the television system, including a first recording of color video from great water depths. The report also included an extensive review of the historical events surrounding the sinking and summarized the U.S. Senate hearings and the Admiralty findings. The report was published in two issues of the "SHIP TO SHORE" which is a journal of the Oceanic Navigation Research Society, Inc. and is of interest to historians of old ocean liners. This article has generated discussion and favorable comment regarding discrepancies in navigation of the *Titanic* and four other ships present at the time the passengers in the lifeboats were rescued. Numerous oral presentations were made to marine historical societies, including visits to Halifax, Nova Scotia, where many of the *Titanic* dead are buried and to the Society of Underwater Technology in London where there was an eagerness to learn more about the equipment used for the search of the *Titanic* and where attention would be given to legal issues related to salvage rights. Officers of the Titanic Historical Society paid a visit to Lamont-Doherty Geological Society where they were shown original sonograph records of the acoustic targets and diagrams depicting several working hypotheses of the movements of various ships on April 14 and 15. Discussions took place concerning the possible locations of the *Titanic's* collision with the iceberg which would shed further light on why the *Californian* did not proceed to the rescue of the *Titanic*.

The budget for the 1981 expedition, film-making and book-writing was estimated at $600,000, all obtained from private sources.

1981 Expedition

Some of the same investors in Titanic '80 Inc. and some new investors re-incorporated in 1981 as Titanic '81, Inc. for the purpose of financing follow-up investigations in the North Atlantic. This corporation again contracted with Columbia University and the Regents of the University of California to re-assemble the technical team of experts from Lamont-Doherty Geological Observatory and Scripps Institution of Oceanography.

In 1981 the decision was made to charter the U.S. Navy-owned Research Vesssl *Gyre*, operated by Texas A&M University. Permission to charter this ship at the full government-audited cost was sought and obtained from the Office of Naval Research with the stipulation that Titanic '81 Inc. would take out full hull and liability insurance on *R/V Gyre*, pay the entire charter and fuel cost in advance, place all geophysical data in the public domain including all navigation tracks and

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provide the Navy with a detailed technical report of the expedition activities and results as had been done in 1980.

1981 Expedition Results

During the 1981 field program all but a couple of the high priority targets of 1980 were inspected at close range with the Deep Tow Instrumentation System developed by the Marine Physical Laboratory. This near bottom vehicle made a series of remote sensing measurements and observations simultaneously including side-, down-,up-, and forward-looking sonar, measurement of the earth's magnetic field strength and distortion, snap-shot video photography, wide- and narrow-angle 35mm photography, profiling of the amount of suspended particulate matter in the water column, measurements of temperature, pressure and salinity, and measurements of the vehicle's distance relative to beacons on the seabed. A detailed near-bottom magnetic survey was completed and one of the targets was given highest priority for futher visual inspection.

For the first time on an academic research ship there was continuous pin-point accurate surface ship navigation for several hours each day using the prototype satellites of the U.S. Government Global Positioning System (NavStar). This test was conducted on the *R/V Gyre* under the auspices of the U.S. Coast Guard with contract to Texas A&M University.

Unfortunately, deteriorating weather and a fixed charter whose length could not be extended allowed only one pass to be attempted over the final selected target with the real-time black & white and color video system. To the astonishment of the expedition team, this pass recorded the image of a propeller-like object suspended above the seafloor at the same time that the vehicle's hydrophone recorded a long-duration metallic scrapping sound. It was as if the vehicle with its downward-looking cameras had rubbed along the hull of a ship that rested more or less on her keel in an upright position.

Computer enhancement of the video tapes and the still 35mm camera transparency film at Texas Christian University indicated the presence of bolts that attach the blade of the propeller to a hub on a shaft. Fabrication of separate blades was the practice in 1912 for the assembly of the screws used on the largest ocean liners. No unique bot or rivit pattern or other imprint allowed the University investigators to announce unequivocally that this object captured on tape and film transparency was from the *Titanic* and not from another ship or similiar vintage. However, Titanic '81 maintained an official position that the wreck of the *Titantic* had been found, and the corporation publicly announced in an open press conference that further investigations would be made to document and extend this finding. The Titanic '81 corporation also expressed concern that its large financial investment could be compromised by other salvagers who could take advantage of the fact that all the navigational tracks (not only the surface ship but also of the near bottom vehicles) were placed in the public domain at the request of the U.S. Navy.

This final report was delivered by Scripps Institution of Oceanography and Lamont-Doherty Geological Observatory to Titanic '81, Inc. and the Office of Naval research in April, 1982. The highlights of the 1980 and 1981 expeditions were released as a documentary film directed by Michael Harris and narrated by Orson Welles, entitled "Search for the *Titanic*". The expedition narrative was published by Beaufort as a 206 page book authored by William Hoffman and Jack Grimm, entitled "Beyond Reach".

1982 Project Hiatus

No further field programs to continue the search and documention effort were undertaken in the summer of 1982. Although the contract with Columbia University stipulated right of use to the Texas corporation of this sonar and photographic equipment anytime before April, 1985, equipment and personnel at Lamont-Dohertry Geological Observatory were obligated for other projects contracted with the U.S. Department of Commerce. In 1982 a portable deep sea winch that can handle tethered vehicles with 30,000 feet of armoured electrical cable was constructed at

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Columbia University without expenditures of any funds from U.S. Government agencies.

During 1982 Titanic '81, Inc. completed and released its documentary film and published its book describing the results of the two expeditions and its historical research.

1983 Expedition and Results

In 1983 a re-incorporated Titanic '83, Inc. once more contracted with Columbia University for "Side Scan and Video/Photographic Surveys on the Southeast Continental Margin of Newfoundland on the *R/V Conrad*". This expedition also took place on a U.S. Navy-owned ship, this time the Research Vessel *Robert D. Conrad* which since 1964 has been maintained and operated by Columbia University. Titanic '83, Inc. agreed with the Office of Naval Research to pay the full charter costs, take out hull and liability insurance, place all the geophysical data in the public domain and provide a final technical report of the activities and results in 1983.

The prime objective in 1983 was to locate the 1981 high priority "propeller" target in the framework of expendable bottom-moored acoustic beacons. A near bottom side-looking sonar and magnetometer would be used to relocate the target captured on video tape. Then the spot would be fully documented by hovering over it with deep sea cameras and the deep sea video. Gale force winds prevented execution of this plan. Instead, only some of the sonar mapping aspects were accomplished. It became impossible in 50 knots winds to properly maneuver the ship over a single spot in 12,500 feet of water. Only a drifting pass was made with the camera vehicle. When the camera reached the bottom it was not on a path that would intersect the inferred wreck site. Before departing the search area the first mate of the *R/V Robert D. Conrad* conducted a memorial service and laid a wreath above the gravesite.

The main results are in a document entiltled "Report of the 1983 Field Program to Search for the *R.M.S. Titanic*," delivered by Columbia University to Titanic '83, Inc. and the Office of Naval Research in October, 1983.

Expenditures for the 1983 expedition exceeded $600,000, again all raised from private sources.

Non-Exclusive Nature of the Titanic Project

In no cases have any of the Titanic corporations requested an exclusive licensing arrangement or fee for use of the equipment developed with their funds. On the contrary they have encouraged its widest possible use for the advancement of science and for the broadening of knowledge concerning resources within the Exclusive Economic Zone of the United States and her NATO Allies. The Titanic corporations have taken seriously the proclamations of President Ronald Reagan that private enterprise should play its role in the support of basic research so that the various oceanographic institutions do not have to rely so exclusively on federal grants.

All of the new equipment developed with funds from Titanic '80, inc., Titanic '81, Inc., and Titanic '83, Inc. has been placed into the inventory for academic oceanographic research rather than held exclusively for search activities. In fact, within one week of the completion of the first expedition in 1980, the new mid-range side-looking sonar was operating for scientists of the U.S. Geological Survey to study natural hazards on the continental margin of George's Bank and off the coast of New Jersey and Maryland. It was imperative that this detailed imaging of the seafloor take place as soon as the technology was available so that the Department of the Interior could proceed with offshore lease sales that have generated hundreds of millions of dollars of federal revenue.

Government Agencies Which Have Used the New Equipment

The sonar, magnetometer, camera and video vehicles financed entirely by the Titanic project have been put to work in the national interest for up to six months each year for five years. The new equipment has supported U.S. Government and other basic research projects with no strings

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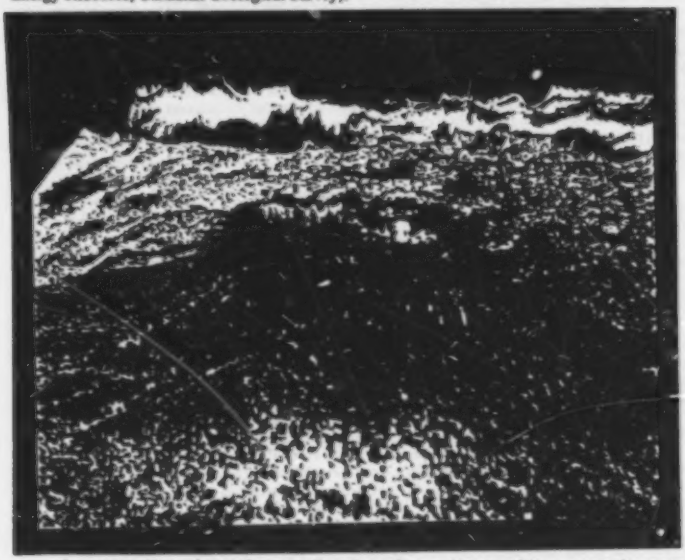
attached, and has been highly sought after. It has been used by scientists affiliated with the U.S. Geological Survey (Department of the Interior), Sandia National Laboratories (Department of Energy), the National Ocean Survey of the National Oceanic and Atmospheric Administration (Department of Commerce), the Ocean Drilling Program (U.S. National Science Foundation), as well as in multi-institutional scientific projects funded by the Office of Naval Research (Department of Defense). Recently the equipment has returned from sea where it was deployed in surveys of massive sulfide ore deposits whose jurisdicition is related to the U.S/ Canada maritime boundary issue in the Northeast Pacific Ocean (relevant to the Department of State).

Abroad, the equipment developed by the Titanic Program has been used in the Mediterranean Sea during coop.rative programs between U.S. scientists and scientists from Spain (U.S.-Spain Program administered by the National Science Foundation, Division of International Programs), France (IFREMER), Italy (Consiglio Nazionale delle Ricerche), and Canada (Bureau of Mines and Energy Resouces, Canadian Geological Survey).



A perspective view of a small submarine volcano with a summit crater illuminated by the Sea MARC I side-looking sonar. The rift separating the Pacific and Cocos Plates is in the background. The base of the volcano is 1 km in diameter. The instrumentation that permits this single glimpse of an entire volcano as if it was out of water and lit by the sun was funded by Titanic '80, Inc. The image was collected on a research project funded jointly by the U.S. National Science Foundation and the Office of Naval Research.

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This past summer the video equipment was maintained in a ready status so that it could be mobilized in 24 hours to look for the Air India aircraft that disappeared in the eastern North Atlantic.

A clone of the Sea MARC I side-looking sonar has been constructed by International Submarine Technology, Ltd. in order to undertake classified research for the Department of Defense because Columbia University, by agreement with its Senate, does not undertake such projects.

A second-generation Sea MARC II has been in operation for three years and has been used extensively by investigators from the University of Hawaii to explore the western and southern Pacific Ocean.

The Sea MARC I side-looking sonar and sub-bottom profiler has been used by the major oil companies (Exxon, Shell and Phillips Petroleum) to assist in positioning of rigs and potential pipelines in very deep water areas of the Gulf of Mexico and on the mid-Atlantic continental slope.

A new Sea MARC IV is on the drawing boards and will be operated by a private enterprise geophysical survey company for a consortia of Texas universities.

Foreign Clearances and the Legal Issue

The investigations on the southeast margin of Newfoundland lie outside of the Exclusive Economic Zone (200 nautical mile limit) of Canada, a country which was a signatory to the Law of the Sea Convention. The Titanic corporations kept the Canadian government fully appraised of their activities through contacts at the Atlantic Geoscience Center, Bedford Institution of Oceanography, Dartmouth, Nova Scotia. Press releases were issued long in advance of each expedtion, as well as notices to mariners, so that there would be no legal impedances pertaining to rights of exploration.

Lamont-Doherty Geological Observatory sought formal advice from the U.S. Department of State concerning the issue of whether to request foreign clearances from Canada for the surveys conducted on the *R/V Gyre* and the *R/V Robert D. Conrad* in the search area. Lamont-Doherty made sure that all installations of heavy deck machinery were pre-engineered by qualified marine architects and were inspected on-site by appropriate personnel of the U.S. Coast Guard.

Salvage Considerations

The objective of the Titanic corporations was to locate and document the wreck site and condition of the *Titanic*. The documentation was expected to provide answers to important questions of both a scientific and historical nature. The Titanic corporations interpret documentation to include photographic and video pictures of the hull taken by vehicles operated in the water above the wreck, and by smaller vehicles flown into the wreck deployed from robotic devices and/or deployed by manned submersibles such as the *Aluminaut*. .

Future documentation would be carried out by the Texas corporations in an appropriate scientific manner which would assure preservation of the wreck as an important time capsule and not disturb the sacred nature of this gravesite. It was envisioned from the beginning that some objects would be recovered for completeness of the documentation and for laboratory analysis. Preliminary agreements have been made between Jack F. Grimm and the Smithsonian Institution as well as other maritime museums to curate and display objects recovered from the wreck site. It was never intended that the ship would be salvaged in the classic sense for the scrap value of its materials or cargo, nor would the hull be raised to the surface. It is the opinion of the Titanic investors that the inspection and documentation of the wreckage belongs in the private sector which is equipped to negotiate with prior claims of title, property and compensation through the structure of courts, national and international.

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Future Scientific Studies

There are many valid scientific and historical inquires to be made at the wreck site and from observations and sampling within the wreck. The following is a listing of a more than a dozen such studies which scientists and historians have formally and informally proposed to members of the past Titanic Expeditions.

1) Rates of bottom community recolonization on various substrates in close proximity to each other with a precisely known initiation time;

2) succession dynamics of bottom communities and ecosystems;

3) sedimentation rates and bioturbation;

4) long term corrosion rates in similar and dissimilar metals and alloys and the influence of pressure, temperature and *in situ* oxygen concentrations in an environment of great stability;

5) possible trigger mechanisms for subsea avalanching;

6) turbulence within thermal and particular matter structure of the benthic boundary layer caused by the structures scattered around the wreck site;

7) preservation of nutrient substances such as wood decks, furniture, drapes and rugs and the role of the sudden introduction of nutrients in the creation of abyssal oasis communities;

8) the effects of toxic properties or trace metals and other decomposable substances on bottom organisms;

9) quantitative analysis of metabolic rates and reproduction rates in the abyssal setting;

10) predation and defense strategies within a complex honey-combed structure in the deep sea;

11) microbial reactions and bacterial concentrations in still existing consumables in high pressure, cold temperature environments;

12) recovery of the ship's charts and logs that possibly could shed light on the role actually played by the vessel *Californian* in the tragic events of April, 1912;

13) inspection of the condition of passageways and exit routes (locked or unlocked) which potentially could reveal important information as to the handling of the disaster by personnel and officers of the White Star Line.

14) The educational value of a well documented visit to and into the *Titanic* could set standards for other wrecks to be discovered in the near future taking advantage of the new advances in deep ocean technology. There is good reason to expect intact wrecks with invaluable ancient historical records from the anoxic abyss of the Black Sea and from the nearly stagnant trenches on the floor of the deep Eastern Mediterranean Sea.

1985 Program of the French Government and the Woods Hole Oceanographic Institition to Locate and Photograph the *Titanic*

Knowledge of the 1985 French/American joint expedition was gleaned from published press reports, discussions with the public relations department and the "Oceanus" publication office at the Woods Hole Oceanographic Institution, discussions with Dr. Robert Ballard, expedition leader, and with members of his Deep Submergence Research Group, discussions with M. Jean Jarry, coordinator for the French team using the side-looking sonar system SAR and with J. L. Michel of the Base Oceanologique de Mediterranee in La Seyne-sur-Mer.

Data Provided to the Woods Hole Oceanographic Institution

In October 1984 Dr. Robert Ballard requested via his research assistant copies of all the sonar data collected on previous search expeditions to be duplicated and shipped to the Woods Hole Oceanographic Institution in Woods Hole, Massachusetts. Since the data are in the public domain at the request of the U.S. Navy, this request was filled, and the cost of reproduction was billed to

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the Woods Hole Oceanographic Institution.

Public Access to a Non-Classified Federally Funded Project

Rumors surfaced in the spring of 1985 that the Woods Hole Oceanographic Institution was planning an imminent expedition to photograph the *Titanic*. Several newspaper reporters and local TV stations in New England and Canada called the Lamont-Doherty Geological Observatory to obtain information, and vented frustration that the Woods Hole Oceanographic Institution was not releasing any news. Instead, the Woods Hole Oceanographic Institution was disclaiming that such an expedition was scheduled. One free-lance reporter published a press story in July in the "Boston Herald" which referenced the Woods Hole Oceanographic Institution as not being forthcoming with information and quoted the U.S. Navy as saying that it was not involved in any direct way with the Titanic project scheduled for August-September. In fact the expedition was scheduled to take place on a U.S. Navy-owned research vessel. Furthermore on the official cruise schedule of the Woods Hole Oceanographic Institution widely released in 1985 to members of the University National Oceanographic Laboratory System, the entire ship charter costs for the 1985 Titanic program were listed as being funded by the Office of Naval Research.

Woods Hole Oceanographic Institution did not make a wide public disclosure prior to the at sea field expedtion that clarified its role, the Federal Government's role, and the role of other enterprises (such as National Geographic Magazine, exclusive arrangements with media, executed negotiations with IFREMER, etc.) in *Titanic* search activities. There was, instead, a last minute exclusive story to Walter Sullivan of "The New York Times" which did not cover many of the issues of concern to investigative reporters and outsiders in the academic community. The issues in question include the co-mingling of taxpayers money awarded to a non-profit organization with other funding from a foreign government and the awarding of exclusive distribution arrangements of what was assumed to be open public data to magazines and private companies. Despite the Freedom of Information Act and probing by an investigative reporter, the U.S. Navy and the Woods Hole Oceanographic Institution continued to hedge that the U.S. taxpayer was picking up most and perhaps all of the bill. The endeavor that the U.S. taxpayer was paying for had potential to compromise the large (estimated $2,000,000) financial investment of existing private sector corporations. The Texas corporations had staked what they thought to be exclusive claims which they expected to be protected by their government and certainly not taken away by their government. The previous Titanic corporations had issued proprietary study rights and salvage claims in the form of non-recoverable acoustic beacons and recoverable beacon anchor assemblies placed on the seafloor amidst their highest priority targets.

Capabilities of the New Search and Documentation Tools

Through visits to the Deep Submergence Research Group at the Woods Hole Oceanographic Institution, Lamont-Doherty engineers and scientists have gained some insight into the capabilities of the new Argo survey vehicle, its surface electronics and its computer enhancement systems. It was learned that the Argo system was being financed entirely by the U.S. Navy with a toal project cost that would exceed $5,000,000. It was also learned that the Woods Hole Oceanographic Institution had contracted the design and fabrication of the Argo video system and telemetry to Colmek Systems Engineering, which was the same company that had designed and built the real time black & white video system for Titanic '80, Inc. The new Argo system had several cameras which used a highly sensitive S.I.T. video tube, which in recent years has widely replaced the less-sensitive vidicon and neuvicon tubes used on the Titanic 1980 and 1981 expeditions. The new Argo system incorporated the ability to illuminate the seafloor with a powerful stobe flash so that the video cameras could operate in a snap-shot mode at a high altitude (beyond 25 meters) for large areal coverage.

Information released by the Woods Hole Oceanographic Institution to "The New York

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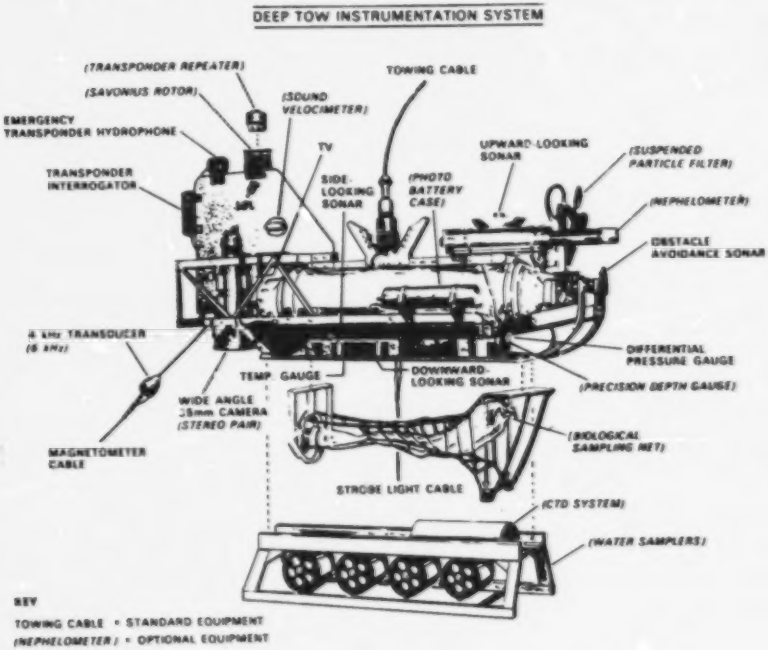
Times" and published in September, 1985 claimed that the Argo technology is revolutionary and goes far beyond that available to other laboratories and agencies. The article implied that towing remote instruments on long electro-mechanical cables is an engineering breakthrough in seafloor mapping because power can be supplied from the surface, results are displayed at the surface instantaneously, and the survey may now be kept operational for days at a time. In fact, the Scripps Institution of Oceanography has been deploying sonar and video/photographic vehicles on long electro-mechanical cables in deep water since the mid 1960's. The strobe flash and video frame-grab technology that was supposedly used in the deep sea for the first timeon the *R/V Knorr* was used in 1981 by Titanic '81, Inc. on the MPL-Scripps Deep Tow Instrumentation vehicle developed at The University of California, San Diego by Dr. Fred N. Spiess and his co-workers.



Sketch of the MPL-Scripps Deep Tow vehicle showing the specialized equipment that was used in 1981 to search the wreckage of the Titanic.

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Lamont-Doherty Geological Observatory has been using the tethered seafloor imaging and mapping technology since 1980, Canadian, German and Japanese researchers since 1982 and the U.S. Naval Research Laboratory since 1978. It has been standard practice to deploy the Scripps-MPL Deep Tow and the Lamont-Doherty Sea MARC I for days at a time, even for periods exceeding a week without recovery. The reality is that the Woods Hole Oceanographic Institution was the last of the major U.S. laboratories to acquire and exploit the technology of towing remote vehicles near the seaflor on electro-mechanical cables. The Woods Hole Oceanographic Institution is also incorrect in its assertion that the *R/V Knorr* was the first to use the Global Positioning System for highly precise satellite referenced navigation. As stated previously, this capability was used in 1981 on the *R/V Gyre*, and it has been standard on most ships carrying Lamont-Doherty scientists since 1982.

There is no wish to downgrade the Argo system and the technical effort of the Woods Hole Oceanographic Institution, IFREMER and U.S. Navy in the field program executed flawlessly onboard the *R/V Knorr* in August and September of 1985. However, it might be useful to point out that in oceanographic research, progress is more commonly obtained through modest step-wise improvement over previous accomplishments and seldom by single breakthrough achievements.

There continues to be a wide sharing of knowledge and experience between the sister oceanographic institutions within the United States as well as collaboration with national laboratories in NATO countries that will not be set back by a temporary display of chauvinism.

There is no need for the Woods Hole Oceanographic Institution to give credit to Lamont-Doherty Geological Observatory, the Scripps Institution of Oceanography or the various Titanic corporations for the marvelous success it had in finding and photographing the *Titanic*. However, the Woods Hole Oceanographic Institution might reflect that it is not the only accredited laboratory qualified to undetake further documentation of the *Titanic*, nor should it suggest that its new survey tools are so extraordinarily sophisticated as to make other existing tools obsolete or unqualified for the documentation. It should be recognized that the Scripps Institution of Oceanography has an operational vehicle with sonar, cameras, video that can be maneuvered with powered thrusters to precisely keep station over artifacts or natural sea floor features for days at a time in water depths to 6000 meters. The Canadian Pacific Geoscience Center has purchased a deep-sea vehicle with thrusters (called ROVs) that can maneuver over an object and that has capabilities to grab and retreive objects. The recovery of the flight recorders from the Air India aircraft in water depths exceeding 6000 feet (2000 meters) is testimony to the capabilities of operational deep sea search and salvage equipment in the private and government sectors.

The Role of the Federal Government in Future Documentation and Recovery Activities

As stated above, there is no technological advantage that places any U.S. Federal agency (*i. e.*, the Department of Defense, Department of Interior or Department of Commerce) or any of the oceanographic institutions in an exclusive position to undertake further salvage activities at the *Titanic* wreck site.

The record of this past summer demonstrates that a search for the *Titanic*, mostly funded by the Federal Government was less open to public scrutiny and less forthcoming with dissemination of its results than the previous search activities supported by private enterprise.

The private enterprise search was more comprehensive in the scope of its activities. It did not just concentrate on the wreck site, but completely mapped the geology of 600 square miles of seafloor, probed its sub-bottom structure, mapped its magnetic field, profiled its water column structure, and sampled its substrate and living plankton. All of the data collected are available to the public.

The private enterprise search has generously made its equipment available, with no strings attached, for basic research in oceanography. It has not been anounced that the Argo system, which is owned by and will eventully be delivered to the U.S. Navy, will be as equally available

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for research of a non-military nature. Could Argo be chartered by foreigns countries to search for sunken ships or downed aircraft, or leased to petroleum and mining companies to explore for resources?

Existing Salvage Technology

The great water depth of the Titanic wreck site (12,450 feet or 3780 meters) makes a salvage enterprise extremely expensive and complex. Today one might use three different approaches to recover objects. The choice of one over the other would depend upon the scope of the operation and the size of objects to be brought to the surface.

If only small objects scattered on the seafloor around the wreck or lying loose on the decks or superstucture were to be recovered, one would most likely choose a small, autonomous manned submersible with manipulator arms and a sample basket. Three submersibles currently operational and one in moth balls could perform this straightforward task. One is the *Alvin*, owned by the U.S. Navy and operated by the Woods Hole Oceanographic Institution. The second is the *Sea Cliff*, owned and operated by the U.S. Navy. The third is owned and operated by IFREMER in France and is capable of diving to 20,000 feet (6000 meters). Objects as heavy as 200 pounds (100 kilograms) could be carried to the surface per dive. Typical time on bottom for a single dive would be less than six hours. The *Aluminaut* could be configured to stay on bottom for 24 hours. The *Aluminaut*, owned by Reynolds Aluminum, could be made operational and recertified in a time frame estimated at less than 18 months and for a cost of under $1,500,000. Costs for the use of a submersible, support ship and technical team would be as large as $25,000 per salvage day. Transit and mobilization costs would be as large as $20,000 per day. The Canadians and the Soviets do not have submersibles with 4000 meters depth capability, but they could modify existing submersibles with investments of $10 to $20 million dollars.

If one wanted to salvage large pieces of the wreckage such as a detached wing of the bridge or a boiler, one would probably charter a large drill ship or semi-submersible. Lifting would be accomplished with steel pipe rather than cables. A special template would be fabricated to attach to the object to be recovered. The template could be manned (an expensive option) or remotely controlled. Up to 1000 tons could be recovered with existing drill pipe. The technology exists to both cut and weld steel *in situ* at depths of 12,000 feet. The drill string approach might be the method of choice by a private company with petroleum or mining interests. Currently there are many suitable vessels idle and looking for work at very reasonable charter fees. The prototype deep sea mining field tests all used ships with tall derricks and long pipes. The technology for station-keeping with dynamic positioning is readily available. Operational costs would range from $50,000 to $150,000 per salvage day. Transit costs would be not much less than $50,000 per day.

If one wanted to stay at the wreck site for weeks or months for an extremely thorough inspection and documentation, one would place a habitat on the seabed that was autonomous from the surface ship. Power and consumables would be replenished periodically with fuel capsules lowered by cable. The documentation would be made by remote vehicles operated with tenders connected to the habitat. This approach would be adopted for a major deep sea archeological excavation. Capital costs might range from $25 to $50 million dollars for a manned habitat. However, daily operational costs might be as low as $10,000 per day since a large support vessel is not required.

No engineering breakthroughs are needed for deep sea salvage operations. The technology is available and simply needs to be purchased.

Countries capable of mounting deep sea salvage operations using domestic technology include France, Canada, Great Britain, Italy, Australia, Japan, Soviet Union, or any country or venture capital enterprise with a large bankroll. A successful effort could be made by totally contracting with non-U. S. companies and with technology that does not have to be licensed from United States companies.

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An Example of a Deep Sea Salvage Project

The Central Intelligence Agency and the Department of Defense salvaged part of a Soviet submarine in water depths exceeding those within the Titanic search area. Expenditure was enormous and has been estimated at $500,000,000 to $1,000,000,000. A dedicated ship, the *Glomar Explorer*, was designed and built for the salvage operation and has been out of service for a decade. This activity remains classified and very little is known about it. The *Glomar Explorer* used the pipe technique to lift the wreckage to the surface. However, in the opinion of the investor groups in Texas, the price tag was exorbitant. To these oil and gas executives familiar with operational costs of large rigs and platforms, the CIA operation is a good example of a federally funded project that threw away taxpayers' dollars for the recovery of objects and information not worth the price paid.

Role of the Federal Government in Deep Sea Salvage

A House bill that places the Federal Government as a regulator of deep sea salvage activities runs a risk of once again spending taxpayers' dollars for elusive and high-risk objectives that may not, in the long run, be worth the funds expended. The Texas investors have serious questions of why the government would want to spend money from its treasury when there are private enterprise companies ready to spend their own money without asking for any subsidy or special privileges.

There are also questions of whether an exclusive or tightly regulated salvage would produce the very best scientific and historical results. The scientific method is based on experiments that can be repeated, observations that can be independently verified, and the broadest dissemination of results. Historical analysis benefits from a wide variety of viewpoints and full discussion of materials. Those carrying out salvage operations can be compared to those directing oceanographic research expeditions. Both need flexibility to make on-site decisions. If the unexpected is discovered, one must be able to redirect the course of excavation to take advantage of new leads. The per day expense of salvage operations is so great as to make resubmissions to regulatory bodies untenable.

Would Regulation Be in the National Interest?

Most Americans would be sympathetic with a sanctuary status for the *Titanic* which would prevent callous plunder and desecration of an abyssal gravesite. The principal issue, however, is the creation of a sanctuary through the laws of a single nation which are to be applied outside the bounds of that nation. The *Titanic* rests in international waters beyond any reasonable interpretation of the Exclusive Economic Zone of the United States. During the lengthy deliberations of the Law of the Sea Convention, the United States consistently took a stand against regulation in international waters, especially regulation of scientific research activities. House Bill 3272 is a reversal of this position and could create new obstacles to oceanographers who require broad access to the ocean and its seabed outside of the jurisdiction of coastal states. There are many ramifications which affect national security issues. Full discussion needs to take place before the United States creates a precedent which could result in unfriendly listening posts on the ocean floor given sanctuary status by being within or near historical wrecks. Participants in the discussion should include those involved with security issues, those involved with ocean policy, those involved with obtaining foreign clearances for ocean-related research, former members of the U.S. delegation to the Law of the Sea Convention, and individuals from the private sector and universities. Diplomats in foreign countries should be polled for their reaction to House Bill 3272.

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Mr. GRIMM. On my left is John Lee, our counsel and one of my associates in the *Titanic* project. He was involved in the 1983 expedition. I would like for you to let him——

The CHAIRMAN. We recognize Mr. Lee.

You may proceed.

STATEMENT OF JOHN P. LEE

Mr. LEE. Mr. Chairman, and members of the committee, I think, first of all, that we certainly don't want to take anything away from Dr. Ballard and I think we certainly commend him and his colleagues for their historic achievement, and the pictures that we have all seen here today. But one thing I waned to emphasize is that Mr. Grimm and our investor group have been working for some years—since 1980 and sometime before—and we worked in conjunction with the scientific and academic communities, in an attempt to do research and exploration for the *Titanic* and this has occasioned considerable expenditures of money, and I think there have been important contributions made in terms of the technology and equipment and information as to the location of the *Titanic*.

I think we are all concerned that after the expenditure of time and money and with the expectation that we be allowed to go forward even further and perhaps even dive on the *Titanic*, we are quite concerned that somehow or another at this juncture, we could be limited or restricted in what we considered our right to explore and do research on a vessel that is sunk in international waters some 1,000 miles from our shorelines, and really outside the jurisdiction of the United States.

And the concern is that some bill is passed, some commission is set, which has jurisdiction over U.S. citizens alone, and we are inhibited from going forward with certain of our plans. That the ultimate result will be that representatives from other governments and other nations in the interim will rush in and be the ones that actually end up doing the work in terms of research and in terms of possible salvage of certain artifacts on the *Titanic*.

So the thing that we want to emphasize is that while we certainly have no objection to some designation of the *Titanic* as a memorial, and while we certainly have no objection to the notion of a huge salvage operation—which we don't even consider feasible—being restricted in some way, we still want to be able in the future to pursue on a private enterprise basis the same plans that we have been working on already since 1980.

Thank you, Mr. Chairman.

The CHAIRMAN. Thank you, Mr. Lee.

The chairman would like to state to you, Mr. Grimm and your associates, that had you been given credit back in 1980-81, whenever it was, that you found a part of the *Titanic*, I feel I would have been compelled to introduce some legislation for historic purposes.

You state limited opposition to H.R. 3272. That opposition seems to be based on several claims, not only by you, but our other witnesses, first that an assertion of regulatory authority over the *Titanic* by the United States is a bad international precedent, and

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second, that the legislation would be discriminatory aginst U.S. citizens.

I would like to assure you that this legislation, H.R. 3272, as the sense of Congress, is not binding in any way until such time as it is implemented by the other nations involved, and then and only then would rules and regulations permit you, and others for that matter, to operate—under those rules and regulations.

This legislation in no way asserts regulatory authority by the United States; it would only apply to U.S. citizens. I would be opposed to discrimination against U.S. citizens unless the other nations set up rules and regulations for their own citizens. It does call for an international agreement and international regulations.

Is it a fair question to ask when you intend to begin salvage operations on the *Titanic?*

Mr. GRIMM. Well, Mr. Chairman, I think the word "salvage" is a misnomer. It is actually, our plans are not to salvage per se, but to try to recover some of the artifacts from the wreck. There have been other wrecks that have been dived on—the *Andrea Doria* was dived on and the *Lusitania*, sunk by German U-boats that started World War I. So, it is not that other wrecks aren't dived on.

We respect the dead and some 20 survivors still living. But whatever we do will be done within the highest standards of oceanography. I don't think anyone can challenge Dr. Ryan and the Scripps Institution of Oceanography, the contribution they have made to science. So, whatever we do out there will be done under the auspices of qualified oceanographers and this will protect whatever pieces we can recover from the fragile—some of them are—and to study the colonization of marine life around the wreck.

There are other facets of the project that we did in our various expeditions. In the 1981 expedition, we spent some 10 or 12 days on the project which was a U.S. Government program. On the way to the *Titanic* we stopped looking for a place where we could dump nuclear waste in some 12,000 feet of water where there weren't any currents.

Our community has made a major contribution also—and I don't feel like that we should belittle our efforts. Whatever we do will be done on the highest standards.

The CHAIRMAN. Mr. Anderson.

Mr. GRIMM. I am sorry. In answer, Mr. Jones, to your question, when we would dive on it, it is a matter of getting the *Aluminaut* recertified and that may take 1 year, 1½ to 2 years to do that.

The CHAIRMAN. Thank you.

Mr. ANDERSON. Thank you, Mr. Chairman.

Mr. Grimm, our first question would be how do you respond to those that feel that for moral, historical, and cultural reasons, a salvage operation should not be attempted. I think you have explained that, but the followup on that is: What do you feel would be the real gain in terms of financial rewards or historical discoveries in attempting a salvage operation?

Mr. GRIMM. I think the film itself and a book would be written about it. We made a film of our first expedition. Or someone else narrated it. The second one—James McClure, "The Virginian," narrated it—the book about our 1981 expedition.

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We have tried to make this a worldwide expedition where everyone could share in it. Thousands of people wrote and asked if they could go or could they be a small part of it someway.

So, what we did was try to share all of our information with the news media. We didn't intend to make it a three-ring circus that some people have referred to our project. It was done on the highest scientific levels.

Mr. ANDERSON. That sounds like you would be developing a book and maybe movies and resulting in a kind of cultural promotion of it rather than selling it part by part.

What I keep hearing is they are going to take parts of the ship and will want to sell parts of the ship itself and that to me is what a salvage operation describes.

Mr. GRIMM. I am glad you analyzed that because that is exactly right. They have led the people to believe that we are a bunch of salvagers. We are not. Quite the contrary.

But I think we can get our investment back with making the film, which is available to the world and the book about the story, the excitement of going out and diving on it. So, I can't see where this is in conflict with disturbing the wreck if we recover a few artifacts from it.

Like I said, the Smithsonian, they first called me when they read about it in 1980. So, these artifacts that we can recover, however small they may be, can be put in university museums.

I am not after the personal gain, financial gain of doing it, because I think we can get that back out of the film and the book.

Mr. ANDERSON. Mr. Lee, you mentioned a moment ago how, if we prohibit U.S. firms from going down there and producing movies, et cetera, other countries would come in and do it and it would discriminate against U.S. concerns.

What about the suggestion of Dr. Ballard's that no artifacts or *Titanic* parts could be imported into the United States unless it was under proper auspices of, I guess, the kind of groups that would make sure they were doing it right? Would that limit it down so that it would be more palatable to you?

Mr. LEE. I remember hearing that suggestion and I presume that he was saying that if the artifacts couldn't be imported into the United States, that the United States would be removed as an economic market for the salvage and because of that the salvage opportunities wouldn't appear as great to other countries.

I assume that is what he was attempting to say. I guess to a certain degree he would be correct in that statement, but I still think that there is a rest of the world out there that probably has the same kind of interest in the *Titanic* that the United States does.

After all it was a British ship to begin with. So, I can't see that that would ultimately be the thing that would discourage salvage attempts or other salvage attempts by other people or other governments.

Mr. ANDERSON. Thank you, Mr. Chairman.

The CHAIRMAN. Mr. Tallon.

Mr. TALLON. Thank you, Mr. Chairman.

I am getting a little concerned about the national precedent that we may be starting with this legislation and also the possibility

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that there may be some discrimination against you, Mr. Grimm. Obviously, you are a good businessman.

You are in business. You have been involved in these type ventures before. I think I am hearing you say you don't want to go down and tear the ship up and sell pieces of it and commercialize it. Would you as a person with experience in this, would you recommend that there should be changes in international law that would keep these kinds of things from happening not only to the *Titanic*, but other ships that have been sunk all over the world as we are developing new technology that would make this possible?

Mr. GRIMM. As you know, there are literally hundreds of ships all over the ocean floor around the world. The major breakthrough as a result of the *Titanic* sinking was all the maritime laws that were passed where there were enough lifeboats. There was continuous 24-hour wireless service on the ships.

Those things have been pretty well taken care of, I think, in previous laws. I don't know what else could be added to the present systems, although we still have sinkings like the *Andria Doria*, which was a disaster and there have been some since then.

So, I can't make any contributions in that field, except I am sure your committee is far more knowledgeable about that than I.

What was your specific question?

Mr. TALLON. My specific question was as a person with experience, as a businessman, do you think there should be international law controlling some sort of regulation as to how these vessels that have been sunk in the past with new technology emerging, how we would treat this in the future or is it going to be something that we are going to be able to go down and I am sure people—you might not be interested in doing this and I don't think you are by virtue of what you have said, I believe—cutting the ship up, selling pieces and parts of it, commercializing it, if you don't do it, what is going to keep somebody else from doing it?

Mr. GRIMM. I think by the sheer force it is in such deep water in a hostile North Atlantic, you can only get there to work in the summertime. Even in the summer we were restricted for days at a time because of the bad weather.

I don't see that happening. Perhaps there could be some bill before the United Nations, but that does not seem practical, too, because then you are interfering with the law of the sea. I think it just has to be a general understanding among the various nations to respect the laws of the high seas and not try to incorporate it under one passage of some bill.

Mr. TALLON. Yes; sir.

Mr. RYAN. This might be something analogous to the Antarctic Treaty where nations that could carry out research in the Antarctic by convention have established a presence in the Antarctic that is subject to regulation and subject to the activities being proper and appropriate.

Essentially, based on the nations that could do it, could have a presence, are the major participants. This isn't going to be an activity that a large number of nations can do, certainly, for a long period of time and there are going to be, as Dr. Ballard said, there are going to be extraordinary wrecks being found in the near

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future and what sets the wrecks in the deep sea aside from the typical treasure ship is that it is a time capsule.

It sinks with everything that was going on that day, whether it was in battle between Rome and Tunisia and plunder would be a disaster to exactly what those ships represent for new insights into history. What they represent is the intactness of their cargo, their situation.

So, it is going to be a problem. It is going to confront us much sooner than we expect and it is going to be an international problem.

It should be arrived at by some consensus. My suggestion would be to start to get a consensus among the parties that could do it.

Mr. TALLON. Thank you very much.

Thank you, Mr. Chairman.

The CHAIRMAN. Mr. Bosco.

Mr. Bosco. Thank you, Mr. Chairman.

Mr. Ryan, under international law, as it now stands, who would be entitled to the *Titanic*?

Mr. RYAN. I am not sure. When Mr. Grimm was carrying out his activities, I received several letters from various individuals and groups in England that felt that they had claim to the cargo of the *Titanic* by agreements they had made with the White Star Line, agreements they had made with Lloyds of London.

Mr. Grimm—the attitude we took toward those was to acknowledge we received those claims and to say that nothing is being removed from the *Titanic* and, therefore, for documentation purposes, which is the subject of what Mr. Grimm is doing, are not covered by what these claims were addressing.

Mr. Bosco. Put another way, would any country in the world be able to stop any citizen of any country from raising the Titanic or doing anything that they could given sufficient resources?

Mr. RYAN. Well, by the fact that your committee has met and is addressing this bill, during the deliberations of this bill, my university, Columbia University, would not carry out an activity because we would not want to be perceived in any way as moving ahead of your committee and its deliberations.

So most of the large organizations would not be available to Mr. Grimm.

Mr. Bosco. Say if I were a Saudi Arabian oil developer with an enormous amount of money and could do whatever I wanted anywhere. Would I have every right to send out a fleet and try to raise the *Titanic*, or plunder it, or do anything else I wanted within my resources?

Mr. RYAN. It could be so interpreted. When the United States raised the Soviet submarine, the fact it was done clandestinely prevented—there weren't many complaints so it was a fait accompli.

Mr. Bosco. There wouldn't be any international military force that could stop me from doing it; is that correct?

Mr. RYAN. No. Not that I am aware of.

Mr. Bosco. If the United States were to pass legislation indicating what we would like to see done in the absence of any international treaties, would we be able to stop someone from doing as they wished with the *Titanic*?

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Mr. RYAN. I don't think so. I think from my contacts with Eframire, the French are intent on their program next summer and will carry that out.

Mr. BOSCO. Mr. Grimm, may I ask you, you mentioned that you feel the value in this effort would be to write a book and do a film and it didn't seem to me in listening to the testimony that your hopes are any different than anyone else's for this project.

Would you envision any form of salvage that would be profitable?

Mr. GRIMM. No. Not really. There is so little that you can salvage from a wreck of this size because you are limited by the depth of the water and the number of vessels that can go down there. There are a few subs like the *Alban* that can go there and it can pick up a couple hundred pounds—200 or 300 pounds—of material.

The *Aluminaut* can probably pick up 500 or 600 pounds. What does that represent?

That is some little fragment of one end of the ship or a piece of debris lying out on the ocean floor that is not even attached to the ship any longer. I think it would be a magnificent thing to have one of the plates of the ship to put in the Smithsonian or one of the naval museums or even in the Halls of Congress.

So that debris will eventually be lost and covered up with silt and sediment if some of it is not recovered, so we will use the highest standards in our efforts to recover those objects unless we are forbidden to do so.

Mr. BOSCO. It is interesting to me that you feel that you have developed much of the technology that made this discovery possible. You did, in fact, discover one end of the ship and Dr. Ballard the other end and the chairman has legislation which he believes would be in the interest of people all over the world.

I don't really see where there is all that much dispute between everyone. I mean I would see that if you were here wanting to take gold bullion or to take the oil paintings from the *Titanic* or take the silverware or the plates and privatize them and sell them or give them to your friends, but that isn't your purpose either.

So I can't help but wonder if maybe this matter can be resolved even within the chairman's legislation.

Mr. GRIMM. I am not at cross purposes with Mr. Jones at all. I didn't mean that. It was just that the bill read to me like it was restricting us the freedom to go do what we had set out to do some 5 years ago. Mr. Hollis with the Titanic Historical Society, which I am also a life member, may have gotten carried away a little bit about us pillaging the ship.

I don't know where anyone got that idea. You can't pillage it. What few things you can take off that wreck, 882 feet long, 46,000 tons of twisted steel? There are very few things that you can recover from it.

But the historical and archeological significance of whatever we can recover, let's bring it up where the people can see it, touch it, and feel it rather than to let it sit there in 12,500 feet of water where nobody can see it.

Mr. BOSCO. Thank you.

Thank you, Mr. Chairman.

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The CHAIRMAN. Mr. Grimm, thank you very much and those who accompanied you, for your testimony.

We now recognize the next witnesses, Dr. Nancy Foster, Chief, Sanctuary Programs Division, Office of Ocean and Coastal Resource Management, National Ocean Service, National Oceanic and Atmospheric Administration; and Mr. Brian J. Hoyle, Director, Office of Ocean Law and Policy, U.S. Department of State.

STATEMENTS OF NANCY FOSTER, CHIEF, SANCTUARY PROGRAMS DIVISION, OFFICE OF OCEAN AND COASTAL RESOURCE MANAGEMENT, NATIONAL OCEAN SERVICE, NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION; AND BRIAN J. HOYLE, DIRECTOR, OFFICE OF OCEAN LAW AND POLICY, U.S. DEPARTMENT OF STATE

Ms. FOSTER. Thank you, Mr. Chairman.

I may summarize a portion of my comments, but I would request that the full text be included in the record.

I appreciate the opportunity to appear here today on behalf of the Department of Commerce to comment on this legislation, a bill to designate the shipwreck of the *Titanic* as a maritime memorial. We believe that the *Titanic* is a unique historic shipwreck of interest to the world community and that as such she deserves a little special treatment.

As you know, we have some experience in protecting a unique and special U.S. ship and that, of course, is the wreck of the Civil War ironclad, the U.S.S. *Monitor* which, as you pointed out, lies off your coast. Our approach to protecting the *Monitor* has been to consider it as an irreplaceable, nonrenewable, cultural resource of national significance. Due to this and to the fact that there is such a high degree of public interest in this particular shipwreck, there is widespread consensus that whatever we do regarding the U.S.S. *Monitor* warrants very careful and deliberate planning before we do it in order that the American public receive the maximum return and benefit for this particular ship.

We have been protecting the ship for 10 years and over the years we have allowed access for research and educational purposes. In fact, we were involved in an expedition in 1979 to the site and over a hundred artifacts were recovered. We did a test excavation at that time and then later in 1983 we recovered the anchor of the ship which, by the way, comes out of conservation this December, having been in the tank since August 1983, that gives you some idea that conservation is not a speedy process.

Our experiences in dealing with this particular unique U.S. shipwreck have provided what we think are useful results which might be applicable to our efforts with the *Titanic*. For the *Monitor*, we have established a project structure that we hope will assure that the most appropriate steps are taken with regard to this ship. We are in the process of forming an executive committee which will be comprised of representatives from the National Park Service, the Smithsonian Institution, the Statue of Liberty Project, the National Trust for Historic Preservation and, of course, NOAA.

As you can see, we have captured what we believe to be the state of the art in historic preservation in the United States. In addition,

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we will be setting up smaller task groups—four, in fact—that will serve in an advisory capacity to this executive committee. These groups will be comprised of experts in particular disciplines, archeology, conservation, history and public relations and fund raising. We are counting on the fact that once we have input from all of these various specialties, we will make the right decisions.

During our 10 years with the *Monitor*, we have established ties with the international community. The international community has expressed an interest, both in the *Monitor* as a ship, in the way in which we, the United States, are dealing with this particular shipwreck because it is so special to us as a nation.

Given our consultations and cooperative efforts, both abroad and here at home, we believe that guidelines can be developed which will serve the intent of this legislation. I recommend that the guidelines called for in section 5 of this bill be developed jointly with the other nations of primary concern such as the United Kingdom, France and Canada.

We feel that having their cooperation, will acknowledge the international significance of the *Titanic* and send a signal that the United States recognizes that the *Titanic* is of the world and not of the United States. Besides the fact we think that we would profit considerably from the benefit of their experiences over the past years. We are prepared to work on the development of the guidelines and to assist the State Department as it negotiates an international agreement to protect the *Titanic*.

Now, I will be glad to furnish you with additional information about the *Monitor* project if you so desire.

Thank you for the opportunity to comment.

[The statement of Ms. Foster follows:]

PREPARED STATEMENT OF DR. NANCY FOSTER, CHIEF, SANCTUARY PROGRAMS DIVISION, NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, U.S. DEPARTMENT OF COMMERCE

Mr. Chairman and members of the Committee, I appreciate the opportunity to appear before you on behalf of the Department of Commerce to comment on H.R. 3272, a bill to designate the shipwreck of the *Titanic* as a maritime memorial and to provide guidelines for the reasonable research, exploration and salvage activities.

The *Titanic* is a unique historic shipwreck and as such warrants special treatment. Its significance stems partly from the emotional reactions and mystique surrounding what is perceived as the world's worst maritime disaster. This aura lingers today. In addition, as a result of this tragedy, the international maritime community focused instant attention on improved safety and international cooperation. The Committee's interest in establishing a maritime memorial is particularly appropriate in view of the fact that the shipwreck is the final resting place for over 1,500 people. To accomplish this task, the Department of Commerce is prepared to assist by drawing from its own experience.

At the Department of Commerce, we have some experience in protecting a vessel, as special to the United States as the *Titanic* is to the world community. As the Committee is well aware, that vessel is the U.S. Naval civil war ironclad vessel, the USS *Monitor*. This year, 12 years following the discovery of the USS *Monitor* off Cape Hatteras, North Carolina, the National Oceanic and Atmospheric Administration (NOAA) and the National Trust for Historic Preservation have joined together in the USS *Monitor* project.

This joint effort was announced in January of this year at ceremonies held at the U.S. Naval Academy. Association with the National Trust will provide NOAA with the means to raise private funds for the project as well as facilitate the widespread participation of universities, other agencies of government and other private organizations interested in helping to preserve the USS *Monitor*.

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The USS *Monitor* and the *Titanic* share interesting similarities. Sharing the same type of "fame" as the *Titanic*, modern attempts to locate the *Monitor* spanned over 25 years and modern technology played a key role in its eventual location in 1973. The number of search efforts being made caused the U.S. Navy Supervisor of Salvage to refer to the interest as the "Great *Monitor* Sweepstakes". The discovery of the USS *Monitor* and its positive identification, as with the *Titanic*, utilized a state-of-the-art research vessel, specially designed to perform deep water search and recovery operations. We believe that what we have learned in terms of deep water technology will be of assistance in efforts vis-a-vis the *Titanic*.

The *Titanic*, like the *Monitor*, is particularly unique and is viewed as a valuable source of information on man's maritime activities that is unavailable elsewhere. NOAA's fundamental approach to the management of the USS *Monitor* recognized the importance of that shipwreck as an irreplaceable and non-renewable cultural resource of national significance. Due to this and the high public interest in it, there is widespread consensus that the efforts regarding the USS *Monitor* warranted careful and deliberate planning so the American public would receive the maximum return and benefit. Access to this particular shipwreck has been granted for research and educational purposes in accordance with the highest standards of archeological and historical research. USS *Monitor* artifacts, such as the lantern, mustard jars, and wine bottles are all available for or on public display. We look forward to December of this year when the 1,200 pound anchor, measuring 4 feet, will be available for similar display.

Our experiences in dealing with this unique U.S. shipwreck have provided useful results which may be applicable to the *Titanic*. NOAA has established a project structure to assure the most appropriate steps are taken. We are forming an Executive Committee comprised of representatives from the National Park Service, the Smithsonian Institution, the Statue of Liberty Project, the National Trust for Historic Preservation and NOAA. In addition, there will be smaller task groups serving in an advisory capacity to the Executive Committee. Those groups will be comprised of experts in particular disciplines, such as archeology, conservation, history, public relations and fund raising. Having input from all of these specialties will insure rational decisionmaking.

We have also established ties to the international community through our work with the USS *Monitor*. Given our consultations and cooperative efforts both abroad and among U.S. agencies and institutions, we believe guidelines can be developed which will serve the intent of this legislation.

I recommend that the guidelines, called for in Section 5 of this bill be developed with other nations concerned (including the United Kingdom, France, and Canada) to acknowledge the international significance of the *Titanic* and to reinforce the international importance of and interest in the *Titanic*. NOAA is prepared to work on the development of guidelines and assist the State Department as it negotiates an international agreement to protect the *Titanic*.

We applaud the efforts of the Congress to address the *Titanic* and we appreciate the opportunity to testify.

Thank you.

The CHAIRMAN. Thank you, Dr. Foster. We appreciate very much your testimony.

At this time, the Chair will recognize Mr. Hoyle, Director, Office of Ocean Law and Policy, U.S. Department of State.

STATEMENT OF BRIAN J. HOYLE

Mr. HOYLE. Thank you very much, Mr. Chairman, for this opportunity to address the full committee on the subject of the protection of the *Titanic*. The Department of State supports the purpose of this legislation to designate the *Titanic* as an international maritime memorial. The *Titanic* represents a unique maritime event because of the circumstances of the disaster and the tremendous number of lives lost. This supposedly unsinkable vessel's loss became a turning point in international maritime safety law.

The bill announces the sense of Congress that the *Titanic* be protected. I know the administration often appears before you and says we have a small number of amendments and then gives you

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something 80 or 90 pages long. I think with a very, very small number of amendments which would emphasize the international character of measures needed to support the *Titanic*, we would fully support the enactment of the legislation.

The bill is an important step forward, in that it recognizes the international character of this subject. The United States cannot achieve the objective of this legislation unilaterally. The United States must consult, discuss and negotiate with others to achieve the end which we all seek.

There are many complicated issues to be addressed. First, there is the vessel's location. It is located on the ocean floor in 12,000 feet of water beyond the jurisdiction of any country. Ownership issues must also be sorted out. It is only with the assistance of the United Kingdom that we can hope to uncover the nature and character of the rights of its nationals in this vessel. Finally, discovery itself may afford certain rights under maritime law and so cooperation with the French Government is vital. For these and other reasons, we endorse an international approach to protect the *Titanic*.

Acknowledging this need for a cooperative approach, the Department of State endorses the concept that the guidelines for protection of the *Titanic* be developed internationally, rather than by the United States alone. A provision in the bill which recognizes the need for a cooperative approach would encourage other countries' support for the creation of a maritime memorial. We could also benefit from their advice in defining this concept so that it is used in a narrow, rather than a broad sense.

I was quite surprised to hear Mr. Grimm's statement that this legislation discriminates in some way between private and public activities associated with the *Titanic*. The administration, of course, would not support such a discrimination. We don't believe that discrimination is embodied in the bill, but I think maybe for our own satisfaction, and that of Mr. Grimm, it might be well if the record were to reflect that there was no intent to discriminate against public or private activities as long as those activities were carried out within the purposes of this legislation and under the auspices of it.

As the committee is fully aware, there are many complicated issues to be addressed. First, there is the vessel's location. You have heard some comment today about the location. It may or may not be on the Continental Shelf of Canada.

I was called shortly before I came to the Hill this afternoon by the Canadian Embassy to remind me that the ship lies on the Canadian Continental Shelf. To be more specific, we are not sure whether or not the ship lies on the Canadian Continental Shelf.

If it does, the use of the term "continental shelf" is in the broad sense. It may rest on the Canadian Continental Rise, which would be within the Canadian Continental jurisdiction within the meaning of article 76 of the United Nations Convention on the Law of the Sea, because it would be within 60 miles of the foot of the slope.

This does not give Canada jurisdiction over the vessel. The Continental Shelf jurisdiction is limited to the development and conservation of resource in situ. A ship of this sort is not a resource of

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the Continental Shelf and, therefore, not subject to coastal state Continental Shelf jurisdiction.

Thus, the ship is located within international waters for purposes of protection. That being the case, it would require the assent of the most interested nations, those with the capability of carrying out any kind of activities, either scientific, cultural or historical or [archeological] or indeed salvage operations in relation to the *Titanic*.

In this vein, I hope the committee won't mind but we have already begun a process envisioned by H.R. 3272 to carry out consultations with other countries which will ultimately, we hope, evolve into an agreement among concerned countries to protect the *Titanic* and to designate it as an international maritime memorial.

Acknowledging this need for a cooperative approach, the Department of State endorses the concept that the guidelines envisioned by the legislation for the protection of the *Titanic* be developed internationally. In proposing to create a maritime memorial beyond national jurisdiction, we must be careful not to interfere unreasonably with the legitimate activities of other countries and their nationals.

In this vein, we can restrict the activities of our own persons and persons subject to our jurisdiction. We cannot prevent, say, a British citizen from conducting activities that would be associated with the *Titanic*. Therefore, we would hope to enter into an agreement, if you will, a reciprocal agreement which would provide that each of the individual countries would regulate their own nationals' activities in a matter harmonized among them so that in some way activities of each of the countries' parties to this agreement would be controlled in a similar manner and there would be no discrimination or no advantageous position of a country that was regulating its nationals in a less strict way. We share Mr. Grimm's concern about regulation.

The CHAIRMAN. Mr. Hoyle, I hate to interrupt you, but time is running out. We have, as they say, an important vote on the House floor. I don't know what it is.

Mr. HOYLE. I am almost finished.

I wanted to emphasize the administration shares Mr. Grimm's concern about regulation. At the same time we recognize that there are persons out there who have made comments that they would like to engage in some form of recovery activities who have not shown as much responsibility or do not have the track record, maybe I should say, of Mr. Grimm or Dr. Ballard. Therefore, we feel that some basic regulatory measures are necessary to try to ensure that, if you will, plunder or irresponsible activities are not carried out.

Thank you, Mr. Chairman.

The CHAIRMAN. Does that conclude, Mr. Hoyle?

Mr. HOYLE. That concludes the basic thoughts.

[The statement of Mr. Hoyle follows:]

PREPARED STATEMENT OF BRIAN J. HOYLE, DIRECTOR, OFFICE OF OCEAN LAW AND POLICY, U.S. DEPARTMENT OF STATE

Thank you, Mr. Chairman, for this opportunity to address the full Committee on the subject of the protection of the *Titanic*. The Department of State supports the

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purpose of this legislation to designate the *Titanic* as an international maritime memorial. The *Titanic* represents a unique maritime event because of the circumstances of the disaster and the tremendous number of lives lost. This supposedly unsinkable vessel's loss became a turning point in international maritime safety law.

The bill announces the Sense of Congress that the *Titanic* be protected. The bill is an important step forward, in that it recognizes the international character of this subject. The United States cannot achieve the objective of this legislation unilaterally. The United States must consult, discuss and negotiate with others to achieve the end which we all seek.

There are many complicated issues to be addressed. First, there is the vessel's location. It is located on the ocean floor in 12,000 feet of water beyond the jurisdiction of any country. Ownership issues must also be sorted out. It is only with the assistance of the United Kingdom that we can hope to uncover the nature and character of the rights of its nationals in this vessel. Finally, discovery itself may afford certain rights under maritime law and so cooperation with the French government is vital. For these and other reasons we endorse an international approach to protect the *Titanic*.

Acknowledging this need for a cooperative approach, the Department of State endorses the concept that the guidelines for protection of the *Titanic* be developed internationally, rather than by the United States alone. A provision in the bill which recognizes the need for a co-operative approach would encourage other countries' support for the creation of a maritime memorial. We could also benefit from their advice in defining this concept so that it is used in a narrow, rather than a broad sense.

In proposing to create a maritime memorial beyond national jurisdiction the United States must be careful not to interfere unreasonably with the legitimate activities of other countries and their nationals. Although, the United States does not have the right to prohibit the nationals of other countries from defacing or salvaging the *Titanic*, we may prohibit our own nationals and other persons subject to the jurisdiction of the U.S. from doing this. It is on this basis that we should proceed.

You may also hear calls for a moratorium. I would urge that language to this effect be avoided in this bill. The Department would support such an approach if it becomes necessary or desirable in the future. There may come a point in negotiating such an Agreement where it would be helpful. If that time comes we may need to return to the Congress for additional legislation.

Since introduction of the legislaton, the United States has solicited the views of the three governments mentioned in the bill. Preliminary indications are positive, as long as the U.S. acts in a cooperative fashion. I know the Committee is interested, as we are, in how negotiations to obtain an Agreement to protect the *Titanic* would be conducted. This will be decided after further consulation with our allies and others taking into account the approach most likely to be successful.

We are exploring the question of what role, if any, the International Maritime Organization (IMO) should play in the proposed negotiations. Tentative indications suggest that IMO officials would support the concept of that Organization providing the forum for negotiations. At the same time, because an Agreement through IMO may require two or more years to achieve, an interim Agreement among the most concerned States may be necessary.

The Committee has asked for information regarding potential claims to the vessel. The rights to the vessel and its contents are indeed quite murky after 73 years. But potential claims could be made by Commercial Union, the company that insured the *Titanic*; a citizen to whom the company may have subrogated its rights; Cunard, the company which owns the vessel; and survivors or heirs of passengers who could prove ownership of recovered property, among others.

Salvage law is complicated and involves distinctions between proprietary or ownership and possessory rights. These issues must all be examined, in consultation with involved governments, if the *Titanic* is to be protected.

The United States will take the lead in encouraging an international agreement to protect the *Titanic*, to insure that it remains a lasting memorial to those who died in the tragedy. While we support the intent of H.R. 3272, we recommend that the legislation be amended as described in the addendum to my statement. I would also note that the costs to implement this legislation would include sums for personnel and overhead involved in assigning one or two persons to engage in multilateral talks, and appropriate sums for travel. This is based on the assumption that other states are interested in entering into a multilateral forum, to discuss coordination of activities pertaining to the *Titanic*. No additional appropriations will be requested by the Administration.

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In concluding my testimony, I would like to emphasize that customary international law supports cooperation among States to protect objects of an archaeological and historical nature found at sea. The United States will work toward this end.

Thank you, Mr. Chairman.

ADDENDUM

The Department of State recommends that the legislation be amended in the following manner.

Section 2—Purposes: In order to promote a cooperative spirit among nations which would be the foundation of any agreement to protect the *Titanic*, this Section should encourage the establishment of an international maritime memorial and the establishment of international guidelines.

Section 5—National Guidelines: The word "International" should be substituted for the word "National" title of this Section. In Section 5(b), language should be added to reflect that interested foreign governments are to be involved in the drafting of guidelines.

Section 6—International Guidelines: The Department recommends that language be added to Section 6(a) in order to assure the proper cross referencing of the purpose of the bill which is to create a maritime memorial.

The CHAIRMAN. Thank you very much for your appearance. I repeat again, this is the will of Congress, permissive legislation is not binding, but try and suggest an orderly way in which the artifacts and other things can be recovered with some degree of safety and conservatism.

Mr. HOYLE. Mr. Chairman, the administration would certainly commend you in taking steps toward that objective and would like to thank you for that.

The CHAIRMAN. Thank you.

Stand in recess for an additional 10 minutes. We have one more witness. We will return in about 10 minutes.

Mr. BOSCO. Mr. Chairman, may I ask a question when we get back of one of these witnesses?

The CHAIRMAN. You certainly may, sir.

[Recess.]

Mr. BOSCO [presiding]. Call the meeting back to order.

While Mr. Jones is making his way across the street, I will, if I could—I would like to ask Dr. Foster a question and that is, was it NOAA that funded the exploration on the *Titanic*?

Ms. FOSTER. No; you mean in the beginning when it was discovered or since then—since it has been designated as a sanctuary?

Mr. BOSCO. Either.

Ms. FOSTER. I am sorry. The *Titanic*. You can see I am thinking Civil War ironclad. No; So NOAA did not have any funding participation in any of this operation?

Ms. FOSTER. Not to my knowledge.

Mr. BOSCO. Do you know if any other agency of our Government did? Would it be the Department of Defense or the Interior Department?

Mr. HOYLE. My understanding is—is Dr. Ballard still here? It was my understanding it was funded largely by the Department of Defense.

Mr. BOSCO. By the Department of Defense?

Ms. FOSTER. The Navy.

Mr. HOYLE. That the *Titanic* was discovered incidentally to an equipment testing program of the Navy.

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Mr. Bosco. And the Navy was using this same equipment that Mr. Grimm and others had helped to develop to do a general exploration of the ocean floor or they decided because they could kill two birds with one stone they might explore the territory of the *Titanic*?

Mr. HOYLE. My understanding, Mr. Chairman, is this equipment was being tested for the purpose of deep-sea submersibles to try to find ships or submarines that might have sunk, and the prospect of trying to work out something for the recovery of submarines that might sink in an area and still have life on them, part of the Navy's project to try to recover submarines that are in distress.

Mr. Bosco. The chairman is back so why don't I hand the chair back over to you and I would like to ask another couple questions.

The CHAIRMAN [presiding]. The Chair, of course, will continue to recognize Mr. Bosco.

Mr. Bosco. Thank you, Mr. Chairman.

Then, Mr. Hoyle, you say that the Department of Defense is the agency of our Government that funded this entire venture?

Mr. HOYLE. Mr. Chairman, I think we should probably report to you in writing on this because I am getting beyond my own knowledge, but this is my understanding that this was a Navy funded project at the time.

Mr. Bosco. I would be interested, Mr. Chairman, in a response to that question in writing in that I am interested in what agencies of the U.S. Government funded this project and for what purpose. I am also interested in whose rights—who would have proprietary rights over any materials that have been found including photographs or other materials that have been found as a result of this exploration, such things as photograph rights, television rights, or matters or items that would have value such as that.

Mr. HOYLE. Mr. Chairman, I will talk to the relevant Navy people and we will report to you on this.

Mr. Bosco. Thank you very much.

Thank you, Mr. Chairman.

The CHAIRMAN. Thank you, Dr. Foster, and Mr. Hoyle, for your presence here this afternoon and your testimony.

At this time I will recognize the next witness, Dr. Frank L. Wiswall, Esq., former chairman, Legal Committee, International Maritime Organization.

Mr. Wiswall, you are recognized.

STATEMENT OF FRANK L. WISWALL, JR., ADMIRALTY LAWYER

Mr. WISWALL. Thank you, Mr. Chairman.

I think the most merciful thing I can do for the members of the committee and myself at this hour at the end of a long day would be to dispense reading the testimony I have written and if that can be entered into the record, I would just like to make a few points.

The CHAIRMAN. Without objection, the testimony of Dr. Wiswall will be entered in its entirety.

Mr. WISWALL. Mr. Chairman, having heard the witnesses that have testified this afternoon, there is one point that I did not cover in my written testimony because it seems to me to state the obvi-

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ous. I now feel I may have been mistaken in not stating the obvious.

There is at present no law applicable to the *Titanic* wreck except what we refer to in this country as admiralty law. It is all very well to analogize portions of the Law of the Sea Convention or to talk about agreements that might be reached, but there are certain difficulties even in analogizing to the Law of the Sea Convention, particularly in the case of the United States, which is not a contracting State. Certainly, in the nearly 8 years that I attended the deliberations of the Law of the Sea Conference I never once heard any reference to a problem of the sort that the committee is attempting to deal with here— that simply was not an objective in formulating the Convention on the Law of the Sea.

While we are at it, I think perhaps it should be clarified that while terms such as recovery or retrieval or picking up or appropriation, or whatever else you wish to call it, may be used to describe an activity, in maritime law these are all euphemisms for a single word—and that is salvage.

The recovery of an object which was on the ship and is now lying on the ocean floor, even though disassociated physically from the remains of the vessel, is an act of salvage.

Mr. Chairman, my written testimony urges that the United States seek to use the facilities of the International Maritime Organization as the appropriate international forum for negotiation in connection with measures to ensure an orderly and discrete examination of the *Titanic* and to internationally legislate such guidelines as may be necessary to protect the wreck from plundering.

IMO, of course, is not the only intergovernmental organization that could do this job. There are others. Unesco comes to mind. I suppose at the far end of the spectrum it would be possible for the General Assembly of the United Nations to form a committee to do the job.

The reason for my recommendation of IMO, apart from my personal association with the organization over a long period of years, is to urge that the United States—and I do this as a taxpayer—will get more bang for the buck and more expeditious action from that organization than it will from any other intergovernmental organization within my knowledge.

I have made a rash estimate in my written testimony that under the best circumstances, it might be possible for IMO to bring into being an international convention to deal with this matter within a timespan of approximately 3 years and at a cost of approximately $100,000.

That is predicated on what I see as a need for 1 week of Legal Committee time with full facilities of translation and interpretation, a couple of weeks of intergovernmental working groups with partial facilities, and a period out of a diplomatic conference—which would have to be called for other purposes as well in order to make it cost effective—of some 2 to 3 days with full conference facilities.

Of that cost, the United States in accordance with its portion of contribution to the budget of the organization would pay approximately $11,500. That, I think, is a pretty good return on investment.

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I do have reason to believe that the organization would look with favor upon taking this matter into its consideration and offering the necessary facilities.

Mr. Chairman, at this point because I think that probably less is known of IMO than is known of the *Titanic*, I might better serve your purposes by answering any questions that you have.

[The statement of Mr. Wiswall follows:]

PREPARED STATEMENT OF DR. F. L. WISWALL, JR.

My name is Frank L. Wiswall, Jr. I am an Admiralty lawyer and sometime professor of maritime and international law, in private practice in Northern Virginia. It was my privilege to serve from 1974 through 1979 as Vice-Chairman and from 1980 through 1984 as Chairman of the Legal Committee of the International Maritime Organization (IMO), a specialized agency of the United Nations which is headquartered in London. The objective of my testimony is to encourage this Committee, the Congress and the world maritime community to recognize IMO as the most appropriate forum for international negotiation in connection with the provisions of Section 6 of H.R. 3272.

Not very surprisingly, the origin of the International Maritime Organization can be traced directly to the *Titanic* disaster. In the aftermath of the events of April 14, 1912, the maritime nations of the world were briefly galvanized into an attempt to establish international regulations aimed at the prevention of similar casualties. An international diplomatic conference was convened in 1914 to draft the first multilateral treaty on the Safety of life at Sea (SOLAS); by its terms the 1914 Convention was applicable only to passenger ships, and dealt primarily with integral subdivision and lifesaving appliances, the lack of which caused such heavy loss of life in the *Titanic* sinking. Unhappily the advent of the First World War inhibited the entry into force of the 1914 SOLAS Convention, and it was not until 1929 that the second International Conference on the Safety of Life at Sea adopted a broader convention which set strict construction and safety equipment standards, but which was still limited in application to passenger vessels in international trade. Again, however, the advent of a world war swept aside the effective benefits of the instrument.

The brief pre- and immediate post-World War II experience in applying the standards of the 1929 SOLAS Convention convinced the world's maritime authorities that (1) the Convention was too narrow in scope, (2) there was real need for a permanent secretariat to monitor compliance, and (3) a permanent international forum was necessary for the continuing review and resolution of martime safety issues. At the urging of both the United States and the United Kingdom, a diplomatic conference was convened in Geneva in early 1948; this Conference adopted what is now known as the Convention on the International Maritime Organization. Despite the span of forty-six years between the *Titanic* disaster and the entry into force of the Convention on the IMO in 1958, the very clear link between these events is historical fact and not mere romance.

The purposes of the Organization as set forth in Article 1 of the IMO Convention are, in part,

"(a) To provide machinery for co-operation among governments in the field of governmental regulation and practices relating to technical matters of all kinds affecting shipping engaged in international trade; to encourage the general adoption of the highest practicable standards in matters concerning maritime safety, efficiency of navigation and the prevention and control of marine pollution for ships; and to deal with legal matters related to the purposes set out in this Article."

In order to achieve these purposes, the Organization is empowered in Article 3 to consider and make recommendations upon matters arising under Article 1(a) that may be remitted to it by Members, as well as to

"(b) Provide for the drafting of conventions, agreements, or other suitable instruments, and recommend these to Governments and to inter-governmental organizations, and convene such conferences as may be necessary;

(c) Provide machinery for consultation among Members and the exchange of information among Governments;

(d) Perform functions arising in connection with paragraphs . . . (b) and (c) of this Article, in particular those assigned to it under international instruments relating to maritime matters."

Under the authority of the IMO Convention, the Organization has not only brought into being international conventions regulating the safety of merchant ship-

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ping and the prevention of vessel-source pollution, but also maritime legal conventions regarding liability and compensation in connection with marine casualties and pollution incidents. Significantly, the IMO Legal Committee is currently at work on a new convention on marine salvage—the very subject at the heart of H.R. 3272.

There can be little doubt that even three-quarters of a century after the sinking of the *Titantic*, much could be learned from an orderly and discreet examination of the damage which the vessel sustained following her collision with the iceberg and until she came to rest on the ocean floor—knowledge which could well have a bearing upon present-day considerations of naval architecture and ship structure. The same can be said for an examination of the actual positioning of those lifesaving appliances which were not used following the collision. The International Maritime Organization has, therefore, a direct and current interest in ensuring that any exploration of the wreck of the *Titantic* shall be conducted in such a manner that it will not disturb or destroy evidence which could contribute to the primary mission of the IMO in improving and promoting measures designed to ensure the safety of life and property at sea.

In pointing out that the International Maritime Organization is the most competent international organization for purposes related to the *Titantic*, I am not unmindful of the interests of other intergovernmental organizations. The International Hydrographic Organization (IHO) may have an interest in the seabed characteristics in the area of the wreck, as well as in its position; the World Meteorological Organization (WMO) and the International Ice Patrol may both be interested in what, if anything, can be learned of the nature of the iceberg from an examination of the damage to the hull; the United Nations Educational, Scientific and Cultural Organization (UNESCO) may be interested in the marine archaeological aspects of the wreck—and there are doubtless a large number of nongovernmental international organizations having an interest in these and other aspects of the wreck of the *Titantic*. But it is the IMO whose nature, purposes and current work are most directly connected with the cause of the *Titantic* sinking, the prevention of future such disasters, and the international regime of marine salvage.

The International Maritime Organization currently numbers 127 sovereign States as Members, plus Hong Kong as an Associate Member; in addition to the United Nations and its other specialized agencies, a large number of intergovernmental organizations are accredited to IMO, and currently some 43 non-governmental organizations are in consultative status with the Organization. A majority of these State Members and representatives of other interested organizations will be in attendance at the 14th Assembly of the IMO, which will take place very shortly in London—from November 11-22, 1985. At this forthcoming Assembly, it is to be hoped that the delegations of those Member States most immediately concerned in the *Titantic* matter will advocate the adoption of a Resolution of the Assembly compatible with the aims of H.R. 3272. However, such a Resolution would have only the force of moral persuasion pending the negotiation, adoption and entry into force of an appropriate multilateral international instrument.

It is the principal activity of the International Maritime Organization to examine and debate maritime questions with a view to the elaboration, where necessary, of appropriate international instruments. There could be no more appropriate forum for the examination of the matter of the *Titantic*, with a view to formulating a draft international convention governing the research, exploration and protection of the wreck, as well as the important matter of ultimate salvage.

Such a draft convention need not be either lengthy or complex, and in my personal view its elaboration could be accommodated within the present scheduling resources of the Organization and without very serious budgetary implications. If it were possible to present a proposal to the Legal Committee of the IMO in early 1986, the subject might well be able to be teamed with that of the draft Marine Salvage Convention on which the Legal Committee is currently working, and which it is hoped may come before a diplomatic conference in 1988. If this were done, and if a draft convention on the *Titanic* could be considered and adopted by the same conference, IMO's total costs of elaborating and adopting an instrument could be held to about $100,000 and the task could be accomplished within three years.

In order to bring an international convention on the *Titanic* into reality in the shortest practicable period of time, it will be necessary for at least those IMO Member States which are most directly concerned with the matter to present the IMO legal Committee with a proposed draft instrument. In other words, it will be necessary for qualified individuals and representatives of government agencies of the United States, United Kingdom and Canada to meet together and to begin work without delay, with a view to presentation of an initial draft at the 56th Session of

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the IMO Legal Committee which is now scheduled to be held in London from April 7-11, 1986.

I am unable to suggest an existing forum for such preliminary informal consultations involving the most concerned governments; the participants will need to be drawn from diverse backgrounds in order to ensure input from the disciplines of maritime history, archaeology, deep-sea salvage, oceanography, naval security and maritime and international law. My suggestion is that an appropriate agency of the Government of the United States, such asd NOAA, be encouraged to act as host, and with the assistance of the Department of State to promptly extend informal invitations to qualified individuals an counterpart agencies of the United Kingdom and Canada. I am sure that those who have testifed before this Committee today will be able to make helpful suggestions as to individuals able to make the greatest contributions to the preliminary work. The steps envisioned in Section 6 of H.R. 3272 appear entirely suited to the organization of these informal consultations and negotiations, which should be promptly entered into for the purpose of presenting to and supporting within IMO a draft convention compatible with the aims of H.R. 3272.

In conclusion, I must make it plain that the views I have expressed are my own, and that I am not authorized to speak for the International Maritime Organization. That being said, I must also add that in my opinion IMO would welcome the opportunity to act as the host organization for consideration, elaboration and eventual adoption of an international convention concering the wreck of the R.M.S. *Titanic*, and that it would be grateful for the leadership and support of the Government of the United States in such an endeavor.

The CHAIRMAN. Is the gentleman indicating he would like to explain about the IMO? If so, he may proceed.

Mr. WISWALL. The IMO, Mr. Chairman, in the first place, is a nonprofit international organization.

The CHAIRMAN. So is the U.S. Government, but go ahead, sir.

Mr. WISWALL. Yes, sir. IMO has only the distinction of having no direct taxpayers to be able to assess. Its budget is formed by contributions of the nations that are members of this specialized agency of the U.N., based upon the tonnage of their respective merchant fleets.

I am aware that the State Department some years ago in an examination of intergovernmental agencies, found and declared IMO to be the single most efficient specialized agency of the United Nations. I hope it is still of that view, but I won't put anyone from the State Department on the spot to declare it.

There are at present 127 member nations of IMO, of whom between 30 and 40 regularly participate in work of this sort and would make an active contribution.

The people who do the work are serious professionals. They are drawn from all of the relevant fields—of which I believe in light of the objectives of this bill there are really quite a few—and all of them are regularly brought together at IMO.

I do emphasize, though, that it is necessary before going to any international agency or intergovernmental organization, for the informal consultations which I see this bill contemplates to take place between the most interested governments so as to produce a coherent proposal. It is a big mistake, which has been proven repeatedly, to give a concept to an international organization and ask it to start with the skeleton and bring everything out in the flesh. That is not a practical means of proceeding.

Mr. Chairman, that is it. That is what I have to offer the committee unless I can usefully answer any questions that you have.

The CHAIRMAN. Of course, I would like to emphasize for the record one more time that this particular bill, H.R. 3272, expresses

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only the sense of Congress. As far as negotiating any sort of services from any organization, this bill does not provide for that.

In fact, it does not provide for 5 cents of appropriation but nevertheless, I appreciate your presence here this afternoon and thank you very much.

Mr. WISWALL. Thank you, sir.

The CHAIRMAN. That concludes the list of witnesses and with that the committee stands adjourned, subject to the call of the Chair.

[The statements of Capt. W.F. Searle, Jr., USN; Robert L. Scheina; Adm. John B. Mooney follow:]

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PREPARED STATEMENT OF CAPTAIN W.F. SEARLE, JR., USN (RETIRED), CHAIRMAN, SEARLE CONSULTANTS, LTD.

INTRODUCTION

The British Flag passenger liner SS TITANIC collided with an iceberg on the night of 14 April 1912. She sank with considerable loss of life. She was the flagship of the White Star Fleet and was on her maiden voyage. Her destination--New York City.

The ship is known to have been insured on the London Market, and the cargo is likely to have been insured there also. The hull claim was settled though underwriters declined to assume ownership and so the ship is still the property of White Star Lines or their successors. The exact status of cargo claims is not known to us. Doubtless, at the time of the sinking, neither underwriters, nor owners, survivors, or cargo interests would have ever anticipated salving of the wreck; or even any items from it.

Over the intervening years a considerable mystique has grown up about the ship. A particularly interesting account of the disaster will be found in the Time-Life Seafarers Series book: The Great Liners [1])*

In recent years there has been active interest in searching for the sunken hulk of TITANIC using modern and relatively sophisticated underwater search gear of the type common in both military/naval applications as well as in the offshore oil/gas industry's oceanographic/geophysical explorations. Mr. Jack Grimm of Texas is identified as sponsor of a[illegible] explorations; and a goodly number of his team's operating personnel are alumni of the Navy's or NSF's earlier similar work. Location and classification (positive identification) has never been publically reported as a consequence of the several expeditions under the Grimm banner.

In the summer of 1985 according to the proposed legislation (Section 4), a "joint international expedition" which could "serve as a model for future international activities related to TITANIC" discovered the hulk where she rests on the sea bottom. The expedition was sponsored by Woods Hole Oceanographic Institute (WHOI) through its Deep Submergence Section. The "international" aspect involved French scientists/engineers/technicians from IFREMER. Dr. Robert Ballard of WHOI was Expedition Leader and Chief Scientist. Extensive photo coverage was taken and as a consequence there is apparently no question as to the identity of the ship. Expedition management is firm in its contention that the hulk is, in fact, TITANIC.

The hulk, reportedly, rests on the seafloor at a depth of 12,000-plus feet. The reported location appears to place her on the Canadian outer continental shelf, not overly far from where offshore drilling is ongoing and where, some three-plus years ago, CODECO's advanced-design, semi-submersible drilling rig OCEAN RANGER capsized and sank at her moorings with loss of all hands.

As a final point in these introductory and defining remarks, I would note that "London", in the person of the General Manager of The Salvage Association of London, has contacted Captain Searle (and perhaps others) to

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* See Bibliography at the end.

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inquire about these hearings in general. It is fair to characterize "the attitude of London" as being "quite surprised" about this bill; that it seems presumptuous that the U.S. (which neither owned nor insured the vessel; and in whose waters it is not located) sets about to establish a Marine Sanctuary and otherwise make rules and regulations ("Guidelines") to govern. It is worthy of note that the "London" marine insurance community has an interest in many such hulks at various locations in all the world's oceans; and at various depths; and of various vintage. Two such hulks which are of current interest and which have a singular pertinency to this exercise are the SS JOHN BARRY, a World War II U.S. Liberty ship, torpedoed by a German submarine; and the M/V ALIAKMON RUNNER which sank after a fire at sea in February 1983. Both ships are sunk in roughly 12,000 feet; both are reported carrying considerable treasure. The JOHN BARRY had, according to "the story", several million dollars in coinage destined for a Middle Eastern nation; the ALIAKMON RUNNER reportedly carried a $30 million collection of antique temple artifacts from Southeast Asia destined for an European collector. Interest in these two deep targets is real. This evaluation as to the state-of-the-art of deep salvage as it relates to TITANIC has been more easily put together because of our being already somewhat "up on the step" as a consequence of current interest in the ALIAKMON RUNNER case.

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PERFORMING USEFUL WORK--INCLUDING SALVAGE AND OBJECT RECOVERY IN THE DEEP OCEAN

It will be our purpose in this section to briefly track past operations in the deep ocean which were successful in performing useful work; "work" as opposed to search and survey. We use the term "work" to include salving of ship or parts thereof; recovery of cargo or treasure; disposal of hazardous or pollution threat; extraction of minerals and hydrocarbons; or performance of detailed engineering investigation.

The "deep ocean" needs first to be defined. To the sailor the "ocean deep" has, since time immemorial, implied the depth from which nothing could be retrieved. To "Deep Six" something was to intentionally dispose of it over the side and beyond recovery. As the hymn "Eternal Father" goes: "...Who bidd'st the mighty ocean deep, Its own appointed limits keep." But the "limits" have changed in recent years. They have receded or have been driven down. For instance, 40 years ago young Midshipman Searle was taught that the "deep ocean" commenced at the 100 fathom line; 600 feet. The DISTRUCT BILL onboard ship instructed that the code book and crypto wheels, etc. had to be put in a weighted bag and disposed of (deep sixing) outside the 100 fathom curve. Presumably no one would find and retrieve them from that depth. The 100 fathom curve was like the "four minute mile", at least, during the early stages of this story. It was only in 1966/67 after the successful search for and recovery of the H-Bomb off Palomares, Spain, from a depth just short of 3,000 feet that the deep ocean limits were redefined.

Early Deep Salvage Work--Prior to Modern Technology--Pre-Palomares

Early deep salvage (that is, pre-Palomares) was practiced in two totally different arenas. First there was submarine salvage and associated personnel Rescue-by-Salvage. The submarine salvage business--at least in the U.S.--started in March 1919 when the submarine F-4 sank off Honolulu. The depth was just over 300 feet. All hands were lost. The boat was eventually raised under the direction of Naval Constructor Commander Julius Furer.[2] A state-of-the-art was set here with regard to both the mechanical and the diver aspects of deep ocean salvage. Furer designed and organized unique pontoons and lifting gear; and the Navy's divers, brought all the way to Honolulu from the Brooklyn Navy Yard, performed useful work diving, as they did, on plain air at 306 feet. The latter is a record for air diving which still stands today.

Submarine salvage continued to occupy the attention of Navy salvors for the next forty years but generally without significant advancement of the state-of-the-art. The famous U.S. submarine salvage operations--all successful and all following Furer's basic approach--include:

- S-51; September 1925. Sunk at 123 feet depth; off Block Island, Connecticut.
- S-4; December 1927. Sunk at 102 feet depth; east of Cape Cod.
- SQUALUS; May 1939. Sunk at 240 feet depth; off Cape Cod.

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There likewise were submarine sinkings in the Royal Navy and in other fleets in the years 1920 through 1960. For instance, the 1950 sinking of HMS TRUCIENT in the lower Thames Estuary. But the state-of-the-art for submarine salvage did not move significantly--not until after the loss of THRESHER in 1963 and the subsequent major study and report issued by the Navy-sponsored Deep Submergence Systems Review Group.

But before moving up (or rather down) this step and defining a truly new level of state-of-the-art, we note the second, and perhaps a third, arena in which deep salvage was operational. This was the generally quite secretive business of cargo salvage. From time-to-time ships sink and have in them cargo of such notoriety or such value (or both, as witness the above mentioned M/V ALIAKMON RUNNER) that the subsequent search and salvage takes on a notoriety all its own. Two such early salvage operations were the recovery of gold and silver bullion and coins from the SS EGYPT which sank in May 1922 in the Bay of Biscay; and the recovery of 2.5 million pounds-sterling worth of gold bars from SS NIAGARA which had struck a mine and sunk off-shore New Zealand in June 1940. A brief description of each operation will be found in the book Marine Salvage by Joseph Gores.[3]

The two famous operations were performed at the then-formidable depth of just over 400 feet (EGYPT) and 432 feet (NIAGARA); thus, not pushing the depth parameter significantly. Young Communications Officers could still Deep Six their weighted bags at the 100 fathom line. These two operations did, however, affect the state-of-the-art as it applied to managing the open ocean moor of an ocean recovery platform; and they established the twin techniques of using a one-atmosphere (pressure) observation chamber to direct the work at depth--first the placement of explosive charges and then the manipulation of a mechanical grab to recover the treasured objects. This work was much as one manipulates a "game" in the Penny Arcade, attempting to capture the Rolex watch in the jaws of the grab instead of picking up a piece of bubble gum. The magnificent seamanship, the innovative genius, and the tenacity of his Welsh forebears resulted in the award of a Knighthood for Australian, Captain John Williams, leader of the NIAGARA expedition. Sir John, now at 90 years of age, still participates in an occasional in-shore salvage operation. His feat off New Zealand still stands as a prototype in defining state-of-the-art, [4] particularly as it relates to work platform management in the open ocean. John Williams' depth record at 432 feet for the accomplishment of useful work stood, however, but 14 years until the advent of Underwater TV and the arrival of a new client for the deep ocean salvor--namely, the aircraft accident investigators.

One additional point needs to be made about the business of cargo salvage before leaving the subject. By far the leading practitioner of cargo salvage from sunken ships (meaning truly sunk in the sea; not merely "parked" on the bottom alongside a pier) was the Englishman, Mr. Risdon Beazley. From the mid-1930's through the mid-to-late 1960's, this "shadowy, tight-lipped, fascinating salvor" [3] dealt with the insiders at Lloyds and elsewhere, investigating and building a file on every possible sunken ship with valuable cargo in it. He would eventually negotiate for the purchase of rights to the cargo; and then send out an expedition from a superbly equipped base at Northam Bridge, Southhampton. The expeditions routinely

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took a whole season, and sometimes a second one, to thoroughly "work" the wreck to a point where what cargo remained was so difficult to get out that a point of diminishing returns had been reached. The working of the wreck was always as secretive as a military operation lest greedy wreck-robbers get at it during the time the surface support ship and transporter ship were off the site being fueled or during the off season.

Little has ever been written about the "RB" operation as it was called and probably never will be. The old man died in the early 1970's having sold his firm to the German Salvor, Ulrich Harms; which firm in turn was swallowed up by the huge Dutch salvage and towing firm, L. Smit. Captain Searle can attest, however, to the engineering of rigging and deck machinery on RB's surface support platforms--ships especially fitted and designed and built for the lucrative business of recovering full loads of cargo from the deep. His several trips to the RB base at Northam Bridge in the 1964-66 period were eye-openers as to state-of-the-art for long-term, all-weather, open ocean salvage work. This state-of-the-art applies still, in 1985, with improvements in detail and fine tuning only. Success (that is, profit) in cargo salvage depends not so much on innovative seamanship and general mechanical skills as in ad hoc or "normal" salvage operations; but, rather, success in cargo salvage depends greatly on the detailed planning of, and engineering for, a repetitious operation in which the random perturbations (the "ad hoc") are, hopefully, designed out. This lesson is the ultimate one as the work site heads down deeper into the ocean.

New Clients and New Technology--Still Pre-Palomares

There occurred in the mid-1950's and early 1960's a series of aircraft accidents over the sea which had a major influence on the business of performing useful work on the seafloor. There had, of course, long been occasional aircraft accidents and some over the sea--but all of a sudden the skies seemed full of new types of planes being tested or flown as prototypes. New tools for the diver/salvor were coming on-line also--tools such as TV adapted for use underwater; mechanical manipulator or robot devices for use underwater; and the like.

On 10 January 1954 a new and highly touted British airliner, the COMET, while on a routine flight over the Mediterranean, plunged into the sea off Elba. The underwater search which followed was given extraordinary priority and played at a national level. RN forces were mobilized and there followed what was probably the first truly Deep Salvage/Recovery operation.*

The depth of water averaged 650 feet at the site. The salvage aspect of the task followed classical procedures used on the EGYPT and the NIAGARA--observation chamber plus grab. Additionally, underwater television of the then-developing dunking type (as opposed to the now more familiar robot or

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* The term used here is Salvage/Recovery which, in a general sense, follows the approach in the U.S. Navy's directives on the subject: OPNAV Instruction 4740.2 "Salvage and Recovery Program" and OPNAV Instruction 4740.3 "Contingency Plan for Search, Location, Identification and Recovery of Objects on the Ocean Floor."

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swimming type) was used. The key to the operation in this considerable depth was, nonetheless, the availability from the Risdon Beazley firm of one of its observation chambers and a grab system. The surface support ship employed was the RN's SEA SALVOR. Risdon Beazley was put on hire to assist the RN forces.

Commander Gerald Forsberg was in charge of the underwater operations. His evaluation of the shortcomings of the operation [5] is worth studying. Among other things, he suggested use on any future deep operation of a dynamically positioned (DP) drill ship for surface support.

The laborious job of picking up the pieces of aircraft wreckage was very successful and allowed the aircraft accident investigators to record and to rebuild the plane. This, in time, led to corrective measures in her basic design.

The introduction of deep ocean salvage/recovery capabilities to the aviation accident investigators--the new client--had been affected. Since the "first COMET" aircraft recovery in January 1954, there has been a continuum of similar salvage/recovery tasks--some deeper; some shallower; some due to suspected sabotage (for instance, the current Air India operation in the Irish Sea) and many due to malfunctions on operational aircraft as well as test aircraft (viz, the Navy 1963 operation in the upper Chesapeake Bay to recover wreckage from the Martin-built SEAMASTER [P6M]).*

To date there is no record of an aircraft being lost in the sea and on which a cargo salvage operation was mounted for the specific purpose of recovering high value cargo such as gold or precious gems. Such an operation is, however, predicted by Forsberg and others; and it does seem that it is only a matter of time until a plane with such a cargo goes down. Note that most international shipments of bullion and precious gems are handled by air freight.

Yet another client/user of the deep underwater recovery techniques was developing in the 1950's and 1960's. That client was the general group of organizations involved in weapons development and testing. Specifically, the work involves recovery of duds and cold-shots; as well as routine recovery of successful shots into down-range target areas. Recovery of test torpedos had long been a collateral duty of the submarine rescue ships and the shore-side diving locker at various torpedo test stations--but these latter were small boat and shallow water oriented.

The new clients--aviation and weapons--benefitted immediately from the post-Korean War effort in mine countermeasures (MCM) technology. One of the projects in this field was the development of an underwater robot which would swim down to the near-seafloor, search out an underwater object and,

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* And, it might be added, due also to overt and stupid military action. See "Why the United Nations Should be Brought Into the Search for the KAL 747," An essay by W. F. Searle, Jr., Lloyd's List, Friday, September 23, 1983. The "Deep Search" operation for the downed Korean civilian airliner did not achieve success.

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as necessary, work on it. From its commencement in 1953, the Navy program to develop an unmanned, underwater vehicle made good progress in the development of a series of prototypes called MERMUT. This acronym stood for Mobile Electronics Robot Manipulator and Underwater Television System. From mine search and recovery to use in weapon range recovery was an easy transition; likewise, from MCM to salvage/recovery.

By the time MERMUT was into its sixth or seventh version in the late 1950's, the system was "borrowed" from the Mine Warfare Development people in the Bureau of Ships and taken over by the Weapons Development people in the Bureau of Ordnance, and specifically by the laboratory responsible for doing POLARIS launch system or "pop-up" testing; namely, Naval Ordnance Test Station (NOTS), Pasadena, California.

NOTS, Pasadena, reworked and extensively redesigned the MERMUT as passed to them. It was renamed CURV for Cable-controlled Underwater Research Vehicle, and is generally regarded as the first successful, work-oriented ROV--Remote Operated Vehicle. It was this vehicle, and its superb crew of scientists, operators, and technicians which was ordered away from the Laboratory and sent to the Western Mediterranean to participate in the search and recovery of the Palomares H-Bomb. This was in February-March of 1966. The CURV vehicle was instrumental (if not key) in the successful manipulation which led to recovery of the bomb. It was fortuitous that the depth at which the bomb finally rested was but 2,850 feet since the CURV was rated for only 3,000 feet; and she was also limited by the length of her umbilical cable. Lay descriptions of the Palomares H-Bomb operation will be found in both Gores [3] and Forsberg [5].

Palomares--A Full State-of-the-Art Operation

The Palomares H-bomb operation can be taken as one of the major data points in any study of deep ocean salvage/recovery work. As indicated earlier, we view the "first COMET" operation as the first "modern" deep recovery operation. But the COMET operation was but a short extension beyond mine hunting doctrines. The Palomares operation ushered in a whole new era, characterized by, among other things, the management attention and the willingness to apply to the task at hand the entire "bag of tricks" available. That is to say, the Palomares operation became a demonstration of the full state-of-the-art, at the time.

One might inquire as to why the THRESHER operation of 1964 off the coast of New England is not considered in this hierarchy. The reason we have not chosen to focus on THRESHER--and for that matter, several other well known deep wrecks--is that the operation was almost exclusively one of search and classification/identification; and not one of salvage/recovery. For the sake of emphasizing this point, it is well to recognize that in the wide

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countermeasures business, as in any ocean SAR operation, there are three* distinct phases: search, classification (in mine hunting terminology) or identification (in aviation/maritime terminology), and salvage/recovery (or, in the Explosive Ordnance Disposal [EOD] sense, "rendering safe"). Here we address only the state-of-the-art as it applies to the deep ocean work of salvage/recovery; it being assumed that the shipwreck (hulk) of interest is clearly located and identified.

It is, nonetheless, worth noting that the state-of-the-art for deep ocean search is today, and has been for the period of time dating back at least to the THRESHER searches, quite good. The superb work of the scientific teams from the Naval Research Laboratory and under the direction of Mr. Chester Buchanan onboard the USNS MIZAR in searching for the sunken submarine THRESHER, as well as the explosive-laden SS ROBERT LOUIS STEVENSON [6] and the nerve-gas container-laden SS LEBARON RUSSELL BRIGGS [7], to name but a few, led the way for the search operation in the North Atlantic which is the subject of this hearing; namely, the apparently successful search and identification operation of this past summer which resulted from the international expedition of Dr. Bob Ballard and his French colleagues. Lest there be any doubt as to our intent by including this paragraph, we hasten to point out that the roots of this deep search/location/identification operation lie in the pioneering work generally associated with MIZAR and Buck Buchanan, pioneer of the ocean deep.

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* The previously cited (footnote) OPNAV Instruction 4740.3 was an outgrowth of SALVOPS MED, the Palomares H-bomb recovery. Under "Purpose" the instruction states as follows: "This instruction designates the responsibilities for and provides information on procedures which may be applicable to search, location, identification and recovery of high interest objects on the seafloor." The Instruction goes on to define the three phases: Search, Identification, Recovery. The latter phase, Recovery, is defined to include "...the lifting of the object from the seafloor; lifting of specific portions of the object for identification, study, or security reasons; or in some cases, on-site destruction or neutralization of the object." It is interesting to note that the term "salvage" is studiously not used. One can assume that the intent was to keep the instruction strictly "operational" and to not get into a debate with the Admiralty lawyers over terminology: "salvage" versus "recovery." Here we have used the style "salvage/recovery" to make it clear that we, also, choose not to differentiate between the two.

The Palomares H-bomb salvage/recovery operation saw two new or additional work systems added to the state-of-the-art of deep ocean operations.* One was employed extensively in the operation off the coast of Spain; the other was kept in the U.S., in reserve and ready to deploy, but was never sent since the operation was successful without it.

First there was the role played at Palomares by the four manned submersibles (DRV's, or Deep Recovery Vehicles) [8] which were deployed there: ALVIN; ALUMINAUT; Perry Cubmarine (PC-3); and DEEP JEEP. The last two were small and could have been left at home. ALVIN (rated at 6,000 feet) and ALUMINAUT (rated at 6,000 feet) were instrumental, not only in the search and identification phases, but also they were critically involved in the bomb recovery.

Once the bomb had been found, ALUMINAUT with her longer battery life, drew baby-sitting duty at the location on the bottom, keeping the bomb in view while the ALVIN and the unmanned vehicle CURV were being readied for the actual recovery evolutions. ALVIN with her greater agility had originally been programmed to install on the bomb's parachute harness the grapnels at the lower end of three syothetic fiber rope lift lines. These grapnels, however, on the first attempt, failed to hold after ALVIN had skillfully installed them. As a consequence, the bomb fell free after being lifted but a short way. For a period of time the target was again lost and it was thought it might have gone down the slope--perhaps lower than 3,000 feet, the limiting depth for CURV. It was here that the greater depth capability of ALVIN and ALUMINAUT became appreciated. Had the bomb originally been found at, or had it fallen into, these greater depths, these DRV's might have been the only vehicles which could have recovered or otherwise attended the target.

When the bomb was relocated at 2,850 feet and found to be still within CURV's range, it was decided to use the ROV this time to rig the three lift lines to the parachute harness. In performing this rigging job, however, CURV's propellors became hopelessly ensnarled in the parachute shrouds. A crisis was at hand. Finally, the decision was made to hoist the whole ensnarlment as one--three nylon lift lines plus CURV's umbilical cable. This was done successfully and shortly the bomb was hoisted onto the deck of the surface support platform--the Submarine Rescue Ship USS PETREL.

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* The mid-air collision occurred 17 January, 1966, a Monday. The Air Force began to make informal inquiries as to Navy assistance by Wednesday PM. The working line of communication was via the EOD community. By Friday afternoon the Air Force decided to formally request USN assistance. The requesting message was sent from SAC Friday evening. Navy geared up on Saturday and Sunday and quickly got organized. Not often recognized is the fact that Navy had had a lost bomb incident of its own some six weeks before. While the incident occurred in such deep water that recovery was out of the question, they had nonetheless exercised an ad hoc organization to cope with the matter. See "DOD Narrative Summaries of Accidents Involving U.S. Nuclear Weapons: 1950-1980."

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Thus, the Palomares salvage/recovery operation demonstrated the employment of both manned submersibles (DRV's) and unmanned vehicles (ROV's), each for the first time in deep ocean salvage/recovery.

The "other" system, the one which was kept in reserve and which has been given hardly any attention in the popular accounts of Palomares, was a Global Marine Corporation drill ship which was equipped with an early generation dynamic positioning (DP) system. The Navy's Supervisor of Salvage was in continuous touch with the drilling company, Global Marine, as well as the oil company (Shell) which had the drill ship on hire. From early-on in the Palomares operation--starting about the second week in February--the SUPSALV had contingency plans in place for a preemptory tasking of the drill ship which was, at the time, on a program drilling "strat holes" off the Canadian Maritimes and the New England Coast and in the Baltimore Canyon. This capability in reserve was made known to the Commander of the Task Force off Palomares as well as to the Chairman of the Technical Advisory Group (TAG) in the Pentagon.

Each time the drill ship would be about to depart one location and move so as to start another hole, a decision process was exercised by the Navy. "Should the drill ship be broken off from her test drilling and sent to Spain?" In the meantime, various tools and other gadgetry to rig to the bottom of the drill string were being conceived and, in some cases, actually developed. This "on call" situation lasted well into the operation. Finally, when the drill ship had completed its program on the U.S. East Coast and was getting ready to move around and into the Gulf of Mexico, the bomb had just been found and it was decided to "release" the drill ship from her "preemptory, on-call" status. This was done.

The wisdom of the decision was, however, put into some doubt when, next day, the bomb was dropped and "lost" when the grapnels failed. The bomb fell deeper and into a ravine. This unexpected and potentially fearsome development, while it did not lead to the "recall" of the drill ship, did, nonetheless, lead to the study of an alternate recovery scheme whereby the drill ship would be dispatched to Palomares and, rather than lifting the bomb "on-a-string", it would manipulate it with the drill string or, as a last resort, encase it in cement/concrete so that it could be left entombed on the seafloor with confidence that no one else could raise it.

The whole matter of using a drill ship or, better still, a semi-submersible drilling platform, for deep ocean salvage had long been given considerable thought by many in the offshore oil business as well as those in the salvage business. It was in the summer of 1966, for instance, that the Vice President for Engineering of Transworld Drilling Incorporated (a subsidiary of Kerr-McGee Oil of Oklahoma City) lectured to the Navy's Salvage Officers Course in Washington and devoted most of his allotted time to contingency planning the application of offshore oil ships and rigs to salvage problems. The Vice President of Transworld Drilling at that time was Captain J. W. Greely, USNR, who had been, during World War II, Salvage Engineer with the forces in Pearl Harbor raising the wounded battleships and other sunken ships. Keep in mind that most of the major offshore drilling firms were, at their beginnings in the 1940's/50's, founded and/or managed by men who were alumni of the Navy. This cross-fertilization of technology (now called

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ocean engineering) between the offshore drilling operations, in the Gulf of Mexico and later in the North Sea, and the Navy's salvage organization was exciting and productive. It had, and still has to a lesser degree, a very real bearing on the state-of-the-art for doing work in the deep ocean.

The seeds of the idea for using a dynamically positioned (totally unmoored) surface support platform, positioned over a deep sunken object, and performing work via the stiff-armed drill string was very much on the mind of salvors and oil people alike.

Mention should also be made at this juncture as to the relationship of the National Science Foundation-sponsored MOHOLE project. This, too, was a project which had its basis in the application of the same two basic technologies: offshore drilling on the one hand and ship salvage/harbor clearance, including heavy ocean rigging, on the other. The MOHOLE Project also benefitted by the cross-fertilization between, on the one hand, the general oceanographic and marine geophysical sciences community; and on the other hand, practical men like Commander Carl Holm, USNR, of the Navy's WWII salvage organization, and Willard Bascom of the ONR community. Both had been deeply involved with the MOHOLE effort. Bascom, a prolific and creative ocean engineer in the early 1960's, had in fact filed patents dealing with both the searching for and the recovery of objects from the deep ocean seafloor [9]; and Holm was co-editor of a widely used Handbook of Ocean Engineering [10].

Beyond the hardware and the systems themselves, it was, by the end of the Palomares operation, quite apparent that such operations benefitted immensely from innovative and creative management; as well as the ability of the operators on-scene to adapt and create new tools and new schemes to cope with the ever-present "ad hoc" element of salvage work. The concept of a Technical Advisory Group (really, a structured brainstorming committee) sitting in Washington and at the constant service of the Operational Commander was viewed as being one of the key elements of the success achieved at Palomares. Indeed, the post-operations listing of "Lessons Learned" gave great weight to this point. Which is to say that for any complex and difficult deep salvage/recovery operation, attention needs to be paid not only to the platforms--both surface and sub-surface--and work systems on site, but also to the level of operational and scientific talent available and always on call through the workings of a Technical Advisory Group "back at headquarters." The recognition of this powerful management technique may, in the end, be the single most important element of an audit of the state-of-the-art for doing such work as implied might be undertaken on TITANIC.

Thus, we have reached our intitial goal--namely to define what we consider to be the origins of the technology and operational capability whose state-of-the-art as of 1985 you have asked us to evaluate. To summarize, the subsystems or sub-technologies involved at the time of the successful Palomares H-bomb recovery either were, or indicated a requirement for same because of a shortfall at Palomares, the following:

- Surface support platform--all weather, open-ocean capable and preferably dynamically positioned (DP).

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- A means of observing activity on the seafloor or at the work site (the "mine work face", so to speak)--the ROV, DRV and perhaps also the observation chamber.

- A work system and a full bag of tools for performing various evolutions including cutting, joining, placement, insertion, and so forth.

- Vehicle or other means of transporting men/equipment to the job site; for performing assist functions (putting one's "finger on the shoestring as the bow is being tied") and innovating as may be necessary.

- An experienced, innovative management policy and personel at "headquarters".

- Experienced men to manage and operate "in the field."

SCORPION

The next significant data point on this track of major, deep ocean salvage/recovery operations has to be the planning for work on and in the sunken submarine SCORPION. This nuclear powered submarine, it will be recalled, disappeared during an Atlantic crossing, heading home to Norfolk, in the spring of 1968. Her hulk was found and extensively photographed by the USNS MIZAR, resting "in more than 10,000 feet of water some 400 miles southwest of the Azores."* In addition to and in support of the Court of Inquiry, consideration was given to two courses of action in order to investigate the hulk and hopefully to determine what went wrong. One such option was to mount an expedition whereby a submersible vehicle would be sent down to the seafloor so that qualified submarine technical personnel could view the wreck for possible estimation of the cause of her loss.

The other option, and clearly the more costly of the two, was to organize an expedition to survey and to enter and, as might be necessary, salvage parts of the submarine where she lay in the deep ocean.

As indicated in the above quoted CHINFO Press Release, in the spring of 1969 the deep diving submersible TRIESTE II proceeded to the location of SCORPION for on-the-spot observation and additional photographs of portions of the submarine's hull. TRIESTE, it was noted, would carry one technical observer in addition to her two-man crew. And she was credited with having a "limited capability to retrieve small objects from the ocean floor." The operation proceeded on schedule. Captain Harry Jackson, USN (Retired), who is a renowned submarine designer and a Visiting Professor at MIT, served as the technical expert on the dives of TRIESTE.

Pursuing the other option, namely, the conceptual planning for a deep survey/salvage operation on SCORPION, the Office of the Supervisor of Salvage, U.S. Navy, undertook a paper study addressing the feasibility and

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* "Navy reports findings of the Court of Inquiry on the loss of the USS SCORPION" CHINFO News Release No. 80-69; 31 January 1969.

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first-cut cost of the work-platform/work-system aspects of such an operation. The study was unclassified and was predicated on the requirement that the surface platform and the actual ocean engineering operations would be totally non-Navy; more than likely being performed by a qualified firm from the U.S. drilling community (recollecting the standby drill ship at the time of the Palomares operation) and by various support firms from the offshore drilling industry in general.

The leader of the team that performed this study was Mr. Jon Lindbergh, a former naval officer who had served as an advisor to the Task Force Commander at Palomares. He was assisted by technical people--both engineering and operational--from numerous of the nation's leading offshore drilling and service firms. The study also included input from various of the ordnance (including both torpedos and missiles) test ranges covering deep recovery techniques which were both proprietary/commercial and Navy-developed. The report entitled "A Study of Various Marine Systems Capable of Performing Work in 12,000 Feet Water Depth" represents a succinct yet comprehensive definition of the state-of-the-art for deep ocean salvage/recovery as of the 1969/1970 time frame. Three different systems were considered viable and rough cost estimates were put forward for a postulated 30 day operation at 12,000 feet. The three systems were:

- o CURV-type system.
- o J-STAR system (a wire rope manipulated system used on some ordnance test ranges; and also marketed by a firm in Seattle).
- o Drill column system (the drill ship or semi-submersible platform).

Generally speaking, the systems and equipment identified in this earlier study are available today, either as improved items commercially available in the oil industry or at ships/platforms of later design. For instance, while the Navy's dynamically positioned, inshore ocean engineering support ship USNS NAUBUC is no longer available, there are numerous DP support platforms now available in the offshore business which can adequately substitute for it. Similarly, the drill ships and semi-submersible drilling platforms currently available (and some of them are laid up because of poor times in the offshore drilling world) are far superior to those which were available in 1969/70; albeit, carrying a considerably higher per diem lease rate.

Suffice to say, if one were to respond to your questions as to the available state-of-the-art for deep ocean salvage/recovery in connection with TITANIC, and assuming capability more or less as it was in 1969/70 plus improved/extended/new capabilities widely advertised in the offshore drilling and offshore support industries, there is no doubt that the state-of-the-art salvage/recovery operation could be mounted in 1986 on TITANIC.

Other Deep Salvage/Recovery Operations--ALVIN; PICSES III: Air India

To further explore the state-of-the-art for the performance of deep ocean salvage/recovery, it is instructive to audit and briefly note several other successful operations; albeit, generally at a shallower depth and of a smaller size than either SCORPION or TITANIC.

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In October of 1968, while operating approximately 120 miles southeast of Cape Cod and incident to being hoisted onboard her mother ship, the Woods Hole Oceanographic Institute's famous submersible ALVIN (which had participated in the Palomares H-bomb operation) got free of her hoisting rig, and with the hatch open sank to the seafloor. The depth was 5,051 feet. Plans were immediately formulated for raising her. The following summer an expedition under the leadership of the Office of the Supervisor of Salvage and employing the USNS MIZAR as a surface support work platform and the civilian submersible ALUMINAUT, the 16.75 ton (dry weight) ALVIN was successfully raised and returned to her home base.[11] The operation was not in the least bit difficult; the combination of the quite capable ALUMINAUT and the very professionally handled MIZAR being more than adequate for the job.

While operating some 30 to 40 miles southwest of Cork, Ireland, and assisting in the burial of a trans-Atlantic communication cable, the British flag, two-man submersible PISCES III, sustained an accident while being hoisted aboard her mother ship, fell back into the water and sank at a depth of 1,575 feet. This occurred 29 August 1973. Two other submersibles were called to come and assist. One was located in Canada. Additionally, working through the U.K. and USN channels, the CURV III vehicle from Southern California was flown to the scene. CURV III was instrumental in connecting a lift line and shepharding the retrieval of the PISCES III. The two entrapped operators were back onboard and breathing fresh air again after but 84 hours [12]. This operation, however, while it demonstrates the versatility of CURV-type vehicles, must nonetheless be classed as Rescue and not Salvage.

The PISCES III operation, and especially the use of the CURV III, demonstrates however the ongoing development and the improvement/extension of the capabilities of not only the Navy's CURV-type remotely controlled underwater vehicles, but also the booming employment of them in the offshore oil business. Navy laboratories have worked extensively on both the improvement and the development of techniques for the use of these remote controlled vehicles. A CURV-type vehicle capability of working to a depth of 20,000 feet has been proposed by NOSC, San Diego. Various other designs have been proposed and are the subject of various technical papers [13]. Additionally, the office of the Supervisor of Salvage, U.S. Navy, has developed and operates via a contractor a specially equipped, heavy duty, salvage-oriented submersible tethered vehicle called DEEP DRONE. This vehicle has a depth limitation of 7,000 feet.

In the private sector many, many submersible vehicles of the CURV-type and referrred to generically as ROV's are available. There are ROV's of all sizes, shapes, versatility and (of course) cost. Of particular note are the submersible robots SCARAB I and II which were designed and built by the consortium of Atlantic Submarine Cable owners and watched over by AT&T Long Lines Division.* The SCARAB vehicles are among the most significant deep

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* See "How the Black Boxes Were Retrieved." Sea Technology, October 1985 (page 99).

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ocean work-capable devices available today. In this sense they set the state-of-the-art. The SCARAB I is husbanded and operators are provided by the firm, Eastport International, Inc. of Upper Marlboro, Maryland, which firm is also the contractor which has custody of and operates the Navy's DEEP DRONE. SCARAB II is operated by the English firm Cable and Wireless Ltd. of London.

The currently ongoing salvage/recovery operation in the Irish Sea to recover the wreckage of the Air-India Flight 180 is organized around the use of the submersible SCARAB, being operated off a Canadian cable layer, the C/S JOHN CABOT. The water depth is reported to be approximately 6,700 feet. All indications are that the operation is coming along quite successfully, noting in passing that this time of the year begins the stormy season in the North Atlantic.

State-of-the-Art--ROV's

The state-of-the-art as it relates to heavy-work by deep-work capable ROV's is generally quite good for depths to about 10,000 feet [8]. The TITANIC being at 12,000 feet therefore represents a shortfall in capability so far as the existing, commercial ROV is concerned. This is not viewed as being a serious issue; and is certainly not a problem requiring a technological break-through. A firm purchase order from a would-be salvor would elicit interest and fixed-priced proposals from several designers/builders of ROV's, both U.S. and European.

State-of-the Art--DRV's

Addressing now the availability of submersibles (often called DRV's) for possible employment on a salvage/recovery operation to TITANIC, the listing is found to be rather limited [8]. In the U.S. there are three DRV's capable of the depths associated with TITANIC. They are as follows:

- o ALVIN--Operated by Woods Hole, capable of operation to depth of 13,100 feet. ALVIN has proved her versatility on many occasions over the past two decades.

- o SEA CLIFF--This is a Navy-owned and operated DRV capable of work to 20,000 feet.

- o ALUMINAUT--This unique aluminum hulled submersible has seen yeoman service for many years. As noted elsewhere in this report, she was used on the Palomares H-bomb operation; and on the recovery of ALVIN. She has been employed in numerous commercial operations in both the Atlantic and Pacific. To work at 12,000 feet on the TITANIC she doubtless would need to be refurbished and retested since she has not dived for over 15 years. Insurance on her could be a problem.

In general, however, the state-of-the-art in the U.S. as it relates to manned submersibles (DRV's) is good.

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Abroad, only the French are equipped with DRV's which are worthy of consideration for work on TITANIC. The French oceanographic community has two capable submersibles as follows:

- o NAUTILE--A three-man DRV capable of 20,000 feet.
- o CYANA--10,000 foot depth limit.

State-of-the-Art--Management and Manpower

Addressing next the state-of-the-art as it relates to management and general operational capability for performing work in the deep, open ocean, it is worthy of note that since the 1969/70 time-frame, the U.S. ocean-engineering community has been deeply involved in two quite sophisticated areas of technology which bear on this matter. First, the quite complex yet successful development of seafloor mining systems which include the raising of manganese nodules from the seafloor to a mining ship and the subsequent transference to transporter vessels. The ocean depths involved in this ocean mining were of the same order as TITANIC. While the several ocean mining consortia are at present in a near-state of limbo, due to both the economic climate and the Law of the Sea controversy, the manpower--both operating and engineering--which was organized and trained for at-sea operations is generally available to someone who might be serious about organizing an expedition to salve TITANIC.

The second such area of recent interest (though of somewhat lesser sophistication and seriousness) was the OTEC program. This, like the ocean mining business, is in a dormant state; and is unlikely to revive. Nonetheless, some quite useful techniques were conceived and designed which relate to mooring and performing useful work in the open, deep ocean. Similarly, there were some very competent people developed by the OTEC program who might be available to other ocean engineering challenges.

The ocean mining effort in particular conceived of ship and platform designs which, though somewhat different from offshore drilling, would nonetheless be of direct interest (and possible use) to the deep ocean salvor.

The Deep Ocean Working Vessel GLOMAR EXPLORER

Associated with the general subject of ocean mining is the ship GLOMAR EXPLORER. This large drilling-type, DP vessel is identified as a "Deep Ocean Working Vessel" [14] [15]. Its original mission was that of ocean mining for the Howard Hughes organization, and it was contract-operated by Global Marine Corporation. It will be remembered from above that it was this same corporation with whom the Navy's SUPSALV dealt during the Palomares H-bomb search and recovery as we kept tabs on a candidate drill ship on the East Coast. Global Marine were pioneers in the development of drill ship techniques and were, in fact, the contract operators for the National Science Foundation of the original and famous exploration drill ship GLOMAR CHALLENGER.

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The GLOMAR EXPLORER is of particular interest in this state- of-the-art study because of its many technical innovations. In a magazine article in 1976 (Ocean Industry, December, 1976, page 67-72) it was described as "a shipload of ideas that can influence designs for many years to come." About 1980 the ship was the subject of a major sales presentation to various government and private ocean-oriented organizations. A comprehensive presentation (with handout book) was given by Rear Admiral Nathan Sonenshein, USN (Retired), Vice President, Global Marine Development Incorporated [14]. There were many who had the opportunity to hear this presentation to the Marine Board of the National Research Council/National Academy of Engineering and elsewhere. The drill ship GLOMAR EXPLORER is clearly a state-of-the-art vessel which is fully capable of performing salvage/recovery work on the TITANIC. If anything, her use for an operation over TITANIC might be in the nature of an over-kill. (There were those who proposed that it be employed to grasp the sunken hulk of the Civil War ship MONITOR and lift it in one evolution.)

It is noted in passing, and without a full understanding of its implications, that the ship is currently listed and extensively described in the authoritative book The Ships and Aircraft of the U. S. Fleet, 13th Edition, published by the U.S. Naval Institute [15]. She is listed as the USNS GLOMAR EXPLORER (AG-193), and is indicated as having been transferred to the Maritime Administration on 17 January 1977 (the anniversary of the bomber-tanker aircraft collision over Palomares, Spain) and laid up in the National Defense Reserve Fleet in California. It is understood that the other data on page 249 of the Polmar book is unsubstantiated by Navy. In any event, the existence (and, presumably, the availability) of this ship markedly impacts the state-of-the-art for deep ocean salvage/recovery, be the target an old passenger liner or a new cargo ship; a submarine or a space shuttle; or a valuable cargo of temple artifacts. Given a requirement to mount an expedition over the TITANIC, and keeping in mind that such an operation might only be tolerated (funded) if it were a matter of national priority, doubtless the planners would use the GLOMAR EXPLORER as a point of departure.

There is no known ship or work platform in the fleet of any foreign nation which compares even remotely with the capabilities of GLOMAR EXPLORER.

On the other hand, the new US Flag scientific drilling program's drill ship JOIDES RESOLUTION which went on-line in early 1984 as a replacement for the famous GLOMAR CHALLENGER, and which like the CHALLENGER, is operated as an international consortium, has capabilities which would be worthy of consideration were a salvage/recovery operation to be considered at the depth of TITANIC.

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Conclusions

We therefore come to a statement of our conclusions.

We come down solidly with the evaluation that it is state-of-the-art, technically feasible to salvage TITANIC, most likely in sections. We are confident that, from the technical viewpoint, artifacts and other features of the ship could be raised. We cannot, with confidence, tell you how long it would take or how much it would cost. If the operation were deemed to be one of high national priority--such as placing a man on the moon--there is no doubt at all that the operation could be performed.*

As to the second part of the question posed us--namely, the availability, in the U.S. and abroad, of the technology; and the identification as to who owns and sells such technology. There is no question that the United States leads the world in the capability for performing deep ocean work (keeping in mind that we have chosen to focus on "work" and not on search and classification) which in this evaluation specifically focuses on salvage/recovery in a scenario involving the TITANIC. The capability in the U.S. is clearly held totally (though not necessarily solely) by the offshore industry--including both oil and ocean mining. There are doubtless several major drilling and mining companies who would be candidates to organize and manage such an operation. There are doubtless many mixes or subsets as to the techniques and consequently the primary platforms to employ. It is likely that any real-life operation in the deep ocean would, in its conceptual/preliminary planning phases, consider the use of GLOMAR EXPLORER. This "Deep Ocean Working Vessel" might, in some scenarios, be the key to the operation itself. In others, it will be too expensive. We address this point specifically, however, because of its Navy's ownership. Presumably the authority vested in the Secretary of the Navy by 10 U.S. Code Chapter 637 "Salvage Facilities" would be exercised to make it available to the private sector, were the private sector to be the leaders of the operation. The point is, again, that within the U.S. we have the capability to do such work--including salvage/recovery at TITANIC--and with or without government (Navy) involvement.

In a somewhat more general sense, the non-U.S. elements of the world's offshore drilling/mining business could also mount-out and perform work in the deep ocean scenario involving TITANIC. Some nations have a more complete mix of capability than others. The French who are nearly, if not in fact, our equals in the technology of manned submersibles, are the next most likely and most capable to perform such work. The British, though without significant manned submersible capability, are likewise capable of performing useful work at these great depths. Similarly, the Russians must be assumed to be capable or at least planning for such capability.

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* The previously cited OPNAV Instruction 4740.3 applies to operations which "...encompass search, identification or recovery of objects of national or other high level interest from the ocean floor."

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Unsolicited Remarks Relative to Costs

Finally, and recognizing that the questions posed did not include a cost-feasibility element, we nonetheless feel as practical men, compelled to comment on the cost of an operation to salve even small pieces or sections of TITANIC.

Imagine Dr. Goddard, the rocket pioneer, being asked in the mid-30's (at which his career was most productive): "Do you think it state-of-the-art and technically feasible to build a rocket and develop and run a companion program which would place a man on the moon? And how much would it cost?" One can imagine that Goddard's answer would have been: "Yes, it is state-of-the-art and technically feasible to do that job, and possibly even by the 1970's." And he might well have quoted a cost figure in the mega-buck range which, at that time, would have been a cost level beyond comprehension and apt to doom the project. He would have been right as regards the state-of-the-art, the technology, and the management. He would have been wrong--way wrong and way low--concerning the cost.

The salvor is by nature a pragmatic man. We often characterize salvors as pessimistic-optimists. The state of being of the ship to which salvors are called for the purpose of raising, refloating, or otherwise assisting is usually grim, if not terminal. It takes an optimistic man to even consider helping her. And it takes a pessimistic man--be he operator or engineer--to succeed. He must also be a tenacious seaman.

In 1978 Captain Searle was asked to address the problem--both technical and financial--of salving the Civil War Ship MONITOR. He was at the time a member of the Governor of North Carolina's Technical Advisory Committee as provided for in the statute governing the Marine Sanctuary which surrounds and rises to the surface above MONITOR where she lies off Cape Hatteras. In the paper delivered at the National Conference titled "The MONITOR: Its Meaning and Future" at Raleigh, North Carolina, April 2-4, 1978, [16] Captain Searle took a position which is essentially the same one we take here: "Yes, it is possible. But is it economically feasible?"

Further, from the paper "Salving the MONITOR":

> To perform complex and heavy ocean engineering work in the open ocean, at any depth, is a very expensive proposition. Witness the daily cost of drilling operations just now getting underway (1978) off the East Coast. A recent item in the Washington Post indicated that the EXXON Corporation is paying $110,000 per day for the drill ship GLOMAR PACIFIC to drill some exploratory holes there.

He who would seriously consider salving TITANIC would do well to read the paper "Salving the MONITOR." The estimated cost to raise her--in pieces--was in the order of $10,000,000 (in 1978 valued dollars). This estimate was characterized "As a shot in the dark. It may be high. On the other hand, it may be low!"

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The planner when beginning to put a rough, first-cut price estimate on salving the TITANIC may choose to use the MONITOR cost estimate as a model; as a starting point for scaling upward. He will be well advised to keep in mind that the MONITOR was characterized as a "Cheese-box on a raft", whereas the TITANIC was described some 40-plus years later as "the largest vessel ever built." A dimensional comparison of the two is impressive:

	TITANIC	MONITOR
LOA	882.5 feet	173.0 feet
Beam	92.5	53.0
Draft, Full Load	37.0	9.0
Displacement, Full Load	66,000 L.T.	1,200 L.T.
Depth to Sea Floor	12,000-plus feet	220 feet

In the scaling up exercise from MONITOR which is, as noted, in relatively shallow water, close to safe havens, and is of far less displacement and complexity, one should multiply by a large factor to account, first, for the difference in depth; another factor to account for the distance from safe havens and logistic support base; and, finally, a really big factor to allow for the increased size, weight and complexity of the ship.

Finally, one wants to keep in mind what the offshore drilling industry has learned as they "work in the deep, open ocean" drilling and producing in the Labrador Straits and in the Newfoundland offshore areas--namely, that icebergs are a real hazard to the ongoing operations of a drilling rig or a moored or dynamic positioned support platform which is trying to perform work on the seafloor and stay in a fixed position. Icebergs are an ever-present danger. But then--is that not what started this whole exercise in the first place? And so we have come full circle. The icebergs usually win.

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BIBLIOGRAPHIC REFERENCES

1. The Great Liners, The Seafarers: Time-Life Series by Melvin Madlocks; Time-Life Books, Inc., 1978, Alexandria, VA. (TITANIC, pages 124-132; plus photo on page 123.)

2. Submarine Salvage, U.S. Navy Salvage Manual, Volume II (NAVSHIPS 0994-000-3020); Naval Ship Systems Command, Washington, DC , 1970.

3. Marine Salvage: The Unforgiving Business of No Cure, No Pay by J. Gores with Preface by Willard Bascom. Doubleday and Company; Garden City, NY, 1971.

4. So Ends This Day; Autobiography of Sir John Williams of Australia.

5. Salvage From the Sea by CDR Gerald Forsberg, RN; Routledge & Kegan Paul; London 1977.

6. "Search for the Stevenson", by F.M. Daugherty, Jr. and Jerry C. Carroll. Undersea Technology; April 1968.

7. "Nerve-Gas Containers Inspected on the Ocean Bottom"; Ocean Industry; January 1971.

8. Undersea Vehicles Directory 1985; R. Frank Busby, Editor; Publisher: Busby Associates, Inc.; Arlington, VA.

9. "Method for Surveying and Searching the Ocean Bottom and Recovering Objects Therefrom" Patent # 3,215,976; Willard N. Bascom. See also Willard Bascom's landmark book Deep Water, Ancient Ships: The Treasure Vault of the Mediterranean; Doubleday; New York 1976.

10. Handbook of Ocean and Underwater Engineering; Edited by J.J. Myers, Carl H. Holm, and R.F. McAllister; McGraw-Hill; 1969.

11. "ALVIN Recovered--Salvage Operation Unprecedented" NAVSHIPS Bulletin of 15 September 1969 (page 7).

12. No Time on Our Side by Roger Chapman; Nautical, Lymington, England, 1975.

13. Remotely Manned Undersea Work Systems at Naval Ocean Systems Center; NOSC Technical Report # 237 by H.R. Talkington, A status report dated 15 April 1978.

14. The GLOMAR EXPLORER: Deep Ocean Working Vessel--Technical Description and Specifications. Global Marine Development Inc., Newport Beach, CA. (Undated).

15. The Ships and Aircraft of the U.S. Fleet, Thirteenth Edition, by Norman Polmar, U.S. Naval Institute, Annapolis, MD,1984.

16. "Salving the MONITOR" by Captain W. F. Searle, Jr. (page 112-121); Proceedings of a National Conference: The MONITOR: Its Meaning and Future, Raleigh, NC, April 2-4, 1978; The Preservation Press, National Trust for Historic Preservation in the U.S.

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PREPARED STATEMENT OF DR. ROBERT L. SCHEINA, U.S. COAST GUARD HISTORIAN, DEPARTMENT OF TRANSPORTATION, U.S. COAST GUARD

At 2:15 AM on April 15, 1912, the British White Star liner *Titanic* sank, causing the loss of 1,503 lives.

This tragedy has acquired the aura of the world's greatest maritime disaster. In large measure, this unenviable distinction has been created by the large number of lives lost—among whom were numerous distinguished members of society—by the attitude of invulnerability falsely based on recent technological achievements, including the construction of the *Titanic* herself—and, by the air of inevitability created by many authors who have written about the disaster. Books and movies have and will continue to perpetuate the memory of the tragedy.

The sinking of the *Titanic* influenced maritime legislation and regulation in many nations and caused improved cooperation among various maritime nations. In the United States, the disaster had an immediate effect on legislation.

First, laws were passed and regulations issued which increased the control over the use of the wireless. Now, not only passenger steamers but cargo steamships as well are required to have radios. Also, an auxiliary power source is now required in case of an emergency. Regulations required effective communication between the ship's bridge and the radio room. Two or more skilled operators were to be carried, and one was to be on duty at all times when the ship was underway. Also, a bill was passed on August 13, 1912, which gave priority to distress and military messages. These provisions were influenced by events surrounding the sinking of the *Titanic*. The steamship suspected of being the closest ship to the *Titanic* when she struck the iceberg did not have an operator on duty and did not come to the aid of the distressed ship. Also, there was much superfluous wireless traffic which complicated the rescue efforts. Many of these wireless regulations were given international status by the signatories of the Berlin Radiotelegraphic Convention, which included the United States.

Second, the United States adopted certain provisions of the 1914 International Convention on Safety of Life at Sea [SOLAS] with respect to lifesaving devices despite the fact the convention never came into force due to the outbreak of World War I. These provisions were made part of the Seamen's Act of March 4, 1915 and related to the number and character of lifesaving devices carried on board ships. The *Titanic* carried enough lifeboats for only half of those on board. Most lives lost could be attributed to this deficiency.

Third, the same law provided for the certification of "able seamen" and persons qualified as "lifeboatmen." A number of the *Titanic*'s lifeboats were not adequately crewed.

But as the 1912 Annual Report of the Bureau of Navigation noted, "The profound feeling aroused throughout the United States by the loss of the British steamship *Titanic* on April 15, did not find expression in radical legislation difficult or impossible to administer, but readily concurred in the sentiment of other nations in favor of an international conference for the consideration of means to prevent the recurrence of such disasters."

The world's public was stunned by the *Titanic* disaster and their governments immediately sought means to cooperate to avoid any recurrences. The most important gathering was The International Conference on Safety of Life at Sea in 1913-14, in which the United States participated. The responsibility for updating the SOLAS Convention rests with the International Maritime Organization [IMO] headquartered in London, which has served as respository for SOLAS Conventions since its establishment in 1958. The latest major SOLAS revision was done in 1978. Ice and the *Titanic* were the dominant topics at the conference, which convened in London on November 12, 1913. On January 20, 1914, the representatives of thirteen maritime powers signed a convention that provided for "the inauguration of an international derelict-destruction, ice-observation, and ice-patrol service, consisting of two vessels, which should patrol the ice regions during the season of danger from icebergs and attempt to keep the transatlantic lanes clear of derelicts during the remainder of the year." The signatories were: Austria-Hungary, Belgium, Canada, Denmark, France, Germany, Great Britain, Italy, Netherlands, Norway, Russia, Sweden, and the United States. The U.S. was asked to manage this triple task, the expense to be shared by the thirteen countries. Because the convention would not go into effect until July 1, 1915, Great Britain, on behalf of several of the countries, asked the United States to undertake the patrol at once. In fact, two U.S. naval scout cruisers had patrolled the danger area through 1912 following the *Titanic* disaster and in 1913 two Revenue Cutters had been used. On February 7, 1914, President Woodrow Wilson officially tasked the Revenue Cutter Service, a predecessor of

the Coast Guard, to begin immediately the international ice-observation and ice-patrol service.

Each year since 1914, with the exception of war years of 1917–18 and 1942–45, the Coast Guard has maintained the patrol. The duties of the ice patrol are to find and to keep daily track of icebergs and field ice, determine their set and drift, and report this information to the world. Ice observation generally begins in March and ends in August. However, the patrol may be extended whenever there is thought to be a significant threat to the shipping lanes. The patrolled area is about the size of the State of Pennsylvania and is in the general region of the Grand Banks of Newfoundland. In the later part of the ice season, April to July, the area is blanketed in fog, created by atmospheric conditions at the confluence of the Gulf Stream and Labrador current, which adds to the danger.

The need for the International Ice Patrol has been reinforced by events which occurred during World War II at which time the patrol was suspended. The British *Svend Foyne* collided with a berg off the southern tip of Greenland on March 19, 1943 and went down. All 145 persons on board were rescued. There were, however, many other collisions of ships and bergs. On May 27, 1945, the ice almost caused a disaster that would have rivaled that of the *Titanic*. Allied convoy ON-303 was plying across the Atlantic on course for America. For five days thick fog had limited visibility. At 7:10 p.m. the British frigate *Chelmer* reported to the convoy commodore on board a freighter that a surface craft was sighted on the starboard bow of the convoy. A few minutes passed and the frigate corrected the report—it was a growler (a small iceberg). At 7:18 p.m. the *Chelmer* warned large icegberg! A fifteen-second blast belched from the horn on board the commodore's ship, which meant "Turn left, an emergency." No ship responded! Again, the horn blasted and finally horns responded with acknowledgment of the order. The warning had been received and the turn was being executed. But how many of the eighty-three merchantmen and eight escorts understood the warning and endeavored to avoid the ice and each other in a thick fog? The radio tapped out the telegraphed message in hopes of informing all ships. The commodore could not see in the fog; had the convoy executed the turn? The new course was radioed in plain language and all engines were ordered stopped.

Within fifteen minutes, twenty ships had collided with one another, some more than once, and four had struck the iceberg. Miraculously, none sank. Two factors prevented a catastrophe. First, the convoy was making 9.5 knots (12 m.p.h.) about one-half the speed of the *Titanic* when she met her fate. Second, the commodore perceived that a collision with ice was a greater danger than that among ships traveling on a similar course; he had immediately ordered the emergency turn. The following day, May 28, the badly shaken convoy passed over the site where the luxurious White Star liner had gone down.

World War II accelerated the development of electronic aids to navigation such as LORAN (Long Range Aid to Navigation) and RADAR [Radio Detecting and Ranging]. These devices have the potential to make transit of ice infested waters safer, but they could not replace the International Ice Patrol. LORAN permitted ships to more accurately fix their positions and those of icebergs reported by the International Ice Patrol in any weather condition. Before LORAN existed, ice patrol cutters and the transiting merchant ships were at times fogbound for days. Their position had to be determined by dead reckoning and radio direction finder bearings. This was the best technology available in the 1910's '20s, and '30s, and it left much possibility for error.

Radar was another electronic child of the war. Simply, a radio beam is sent out by a ship and, when it strikes an object, the beam bounds back to the sender. The distance to the object can then be computed. Radar had been used with some success in the ice zone throughout the war. In 1947 the first experiments to determine the capability of radar to detect floating ice were undertaken. The results were disappointing. An iceberg wa found to be only one-sixteenth as good a radar reflector as a comparable sized ship. Furthermore, sea water is a better reflector than ice, so there are many weather and sea conditions during which radar could not detect a berg. The maximum range of radar detection of a dangerous size growler is a scant four miles. RADAR has been refined since 1947 but it still has shortcomings in detecting ice.

The International Ice Patrol was resumed by the U.S. Coast Guard in March 1946. Three international safety conferences (1948, 1960, and 1974) have reaffirmed the need for the service. The nineteen supporting countries of the Ice Patrol are: Belgium, Canada, Denmark, Federal Republic of Germany, Finland, France, Greece, Israel, Italy, Japan, Liberia, Netherlands, Norway, Panama, Poland, Spain, Sweden, United States, and Yugoslavia.

There is always danger. Icebergs are a phenomenon of nature, a hazard to shipping which cannot be controlled, regulated, or entirely avoided, even though man periodically perceives that he has mastered nature through technological achievement. On January 30, 1959, the merchant ship *Hans Hedtoft* reported striking an iceberg about forty miles south of Cape Farewell, Greenland. This ship, on her maiden voyage, was equipped with the latest electronic navigation aids, including LORAN and RADAR. She sank without a trace with ninety-five persons on board approximately one month before the start of the 1959 International Ice Patrol, and outside the area assigned to the ice patrol.

Numerous memorials have been dedicated to the victims of the *Titanic*. The most dynamic is the International Ice Patrol. Most of the legislation and regulations which were a direct result of the sinking have been superseded by new laws. But the International Ice Patrol serves on. Neither ship nor life has been lost from collision with ice while the International Ice Patrol was on station since the sinking of the *Titanic*.

PREPARED STATEMENT OF REAR ADM. JOHN B. MOONEY, USN, CHIEF OF NAVAL RESEARCH

Mr. Chairman and members of the Committee, I am pleased to submit this statement providing information on the Navy's role in the discovery of the *Titanic* wreckage.

In brief, the Office of Naval Research [ONR] has contracted with the Woods Hole Oceanographic Institution's Deep Submergence Laboratory, headed by Dr. Robert D. Ballard, to develop the ARGO/JASON Undersea Search and Exploration System. Work on this ARGO/JASON System began in 1982 and, when completed in fiscal year 1988, the total Navy funding will amount to $2.8 million. Dr. Ballard was required by the Navy to demonstrate and test the capabilities of the ARGO unmanned-submersible. Sea trials of ARGO required searching and taking television photographs of the ocean bottom. The Navy had no objections to the research work which resulted in the *Titanic* being located as long as the testing program was accomplished. The *Titanic* discovery is a spectacular demonstration of the ARGO capability. The R/V *Knorr*, a Navy owned vessel, which is chartered to Woods Hole, acted as the ARGO mother ship. It should be stressed that the detailed scheduling of the ARGO testing and specific cooperative arrangement with other scientific organizations during the test leading to the *Titanic* discovery were under the control of Dr. Ballard and Woods Hole and in accordance with normal scientific cooperative agreements.

The 245-foot (74.6 meter) Research Vessel *Knorr* was designed and built under the direction of the U.S. Navy at Defoe Shipbuilding Corporation of Bay City, Michigan. The R/V *Knorr* was accepted by the U.S. Navy in January 1979, and delivered to Woods Hole Oceanographic Institution on April 15, 1970. Woods Hole Oceanographic Institution operates the R/V *Knorr* under a charter agreement with the Office of Naval Research and under technical management control of the Oceanographer of the Navy. The R/V *Knorr* is one of seven such research vessels owned by the U.S. Navy, but operated under charter agreements by various American universities or institutions involved in oceanographic research.

On this research deployment R/V *Knorr* left Woods Hole, Massachusetts on June 17, 1985, with Dr. Purdy and Dr. Langmuir (Woods Hole scientists) for Marine Geology and Geophysis Research. After reprovisioning in Ponta Delgado, Azore Islands, R.V. *Knorr* sailed from the Azores on August 15th with Dr. Robert D. Ballard as Chief (Woods Hole) Scientist aboard for the purpose of testing the ARGO/JASON undersea search and exploration systems which Woods Hole is developing and testing for the U.S. Navy. The *Titanic* discovery occurred during sea trials of the ARGO.

ARGO/JASON is an undersea search and exploration system. It is composed of two major components: the existing ARGO and the developing JASON submersible vehicles, which are unmanned. ARGO is a towed vehicle equipped with an array of sonar and television systems that give scientists a wide view of the sea floor. It has a 20,000 foot depth capability. When ARGO detects an interesting area or object, JASON, a small tethered vehicle, will descend from the ARGO vehicle, make a close inspection, and gather samples with two manipulator arms. Both of the systems make use of the latest in low-light-level television technology.

The ARGO/JASON System has been under development for the U.S. Navy to be used for oceanography research and limited recovery tasks. The ARGO system has been under development by Woods Hole since late 1982 and is scheduled to be com-

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pleted in 1985. JASON development has been started and is expected to be completed by 1988. The Office of Naval Research has invested approximately $1,650,000 on the development of ARGO and about $270,000 on JASON thus far. Another $955,000 is planned to complete the JASON System by the end of fiscal year 1988, for a planned total of $2,880,000 spent over a six year period (1982-1988) on the ARGO/JASON System.

If the *Titanic* site were appropriate for additional testing of Navy deep ocean research equipment, its use could be considered.

[Whereupon, at 4:45 p.m. the committee adjourned subject to the call of the Chair.]

[The following was submitted for the record:]

THE OCEANIC NAVIGATION RESEARCH SOCIETY, INC.,
October 28, 1985.

Hon. WALTER B. JONES,
Chairman, Committee On Merchant Marine and Fisheries,
Longworth House Office Building,
Washington, DC.

DEAR CHAIRMAN JONES AND COMMITTEE MEMBERS: The Oceanic Navigation Research Society [ONRS] is dedicated to the preservation and research of ocean liner history. One of the greatest and most famous ships, *Titanic*, was found under the outstanding direction of Jean-Louis Michel and Dr. Robert D. Ballard of the French and American expedition this past summer. The crew members of the research vessels *Suroit* and *Knorr*, staff of Woods Hole Oceanographic Institution and National Geographic should be highly commended. Their efforts must not be destroyed.

The site of the wreck of *Titanic* is an international historic landmark for all humanity to cherish. It is a memorial to those 1503 lost. It is a monument to an era that also perished on the morning of April 15, 1912. All efforts must be made to make *Titanic* a "neutral memorial or park" much like Turk Lagoon, the Battleship *Arizona* or natural underwater parks. It must be left alone and protected from the grim reapers of profit that plunder history not only underwater but above the seas.

Site restriction should not preclude serious scientific, archologic, historic research and preservtion efforts. *Titanic* and future sites should be well documented. A limited selection of artifacts should be brought up for museums, educational organizations dedicated to maritime preservation and non-commercial activities to bring the past to the present and future generations for their understanding. All efforts should be made to prevent any commercial rape of *Titanic* and future historic wrecks as they are discovered by todays' and future technology. What is beyond reach today can be within our grasp tomorrow. We (ONRS) appeal to you to make sure that grasping hand is gentle with our historic past. May your action bring *Titanic* and other future histories to us all intact for all the world to learn from, enjoy and to preserve. Tie the hands of modern pirates. Pervent their greed to destroy for profit what belongs to all the world, our historic past. Our appeal to you to preserve our maritime past is in your hands. Preserve *Titanic* and other histories now.

Respectfully submitted for the record,

CHARLES IRA SACHS,
President.

NEW BERN, NC,
November 5, 1985.

Hon. WALTER B. JONES,
Cannon Office Building,
Washington, DC.

DEAR CONGRESSMAN JONES: I want to take this opportunity to thank you for your initiative in preserving the *Titanic* where it currently lies.

I see no reason why the ship and its victims should be disturbed in any way.

Fortunately for me, my Father, Grandmother and Uncle were survivors of the sinking. As I grew up, Daddy would tell me about his Mother waking both sons, ages nine and two, and making sure they had the two life preservers on them—that were in their cabin. When an officer saw that Grandma had no life preserver, he took them to his cabin where he put his life preserver on her and said, "here my child, if the boat goes down, you will remember me." Sadly, the Officer drowned with the other unfortunate ones.

Mr. Jones, you have always had my family's support. Before his death, my husband was a Special Investigator with Alcohol, Tobacco and Firearms. During that time you were instrumental in helping him receive his Workmen Compensation benefits.

Continued success in your endeavors in behalf of the people of this area. We are fortunate to have such a fine representative.

Very sincerely,

FAY COUTTS BLETTNER.

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